STEREO DOUBLE AUTOREVERSE CASSETTE DECK

X-F7

SERVICE MANUAL

(UD-703/713/753/763)

KENWOOD

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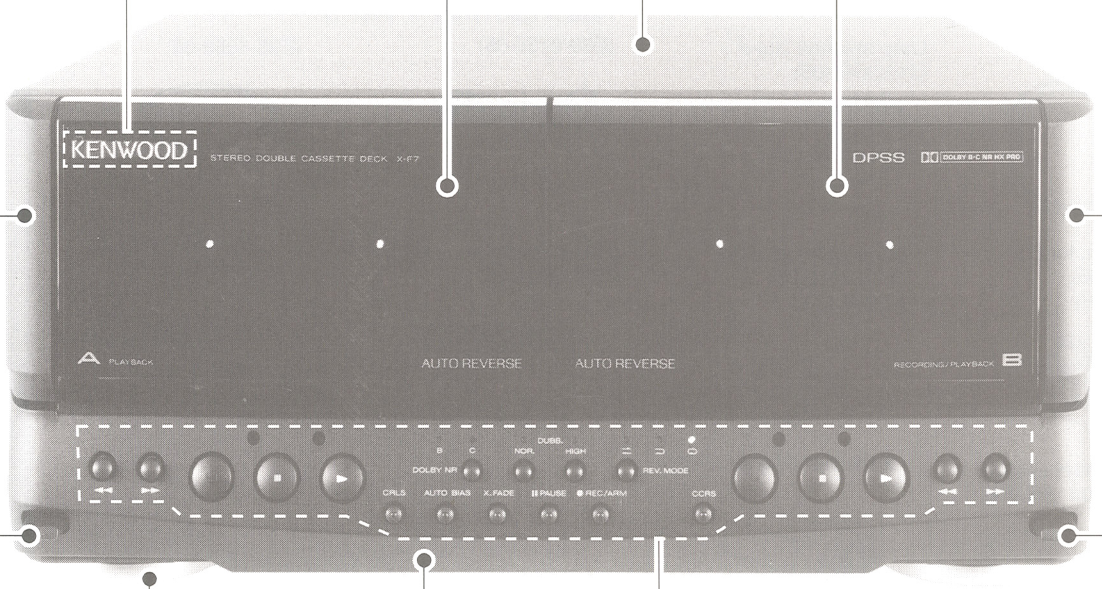
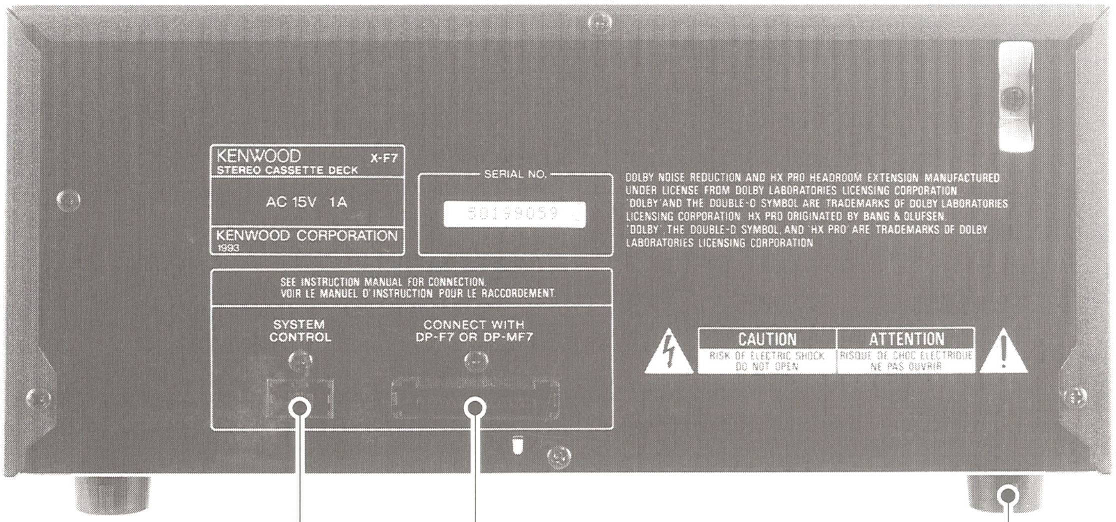

KENWOOD
STEREO DOUBLE CASSETTE DECK X-F7
DPSS
DOLBY B-C NR HX PRO
A PLAYBACK
AUTO REVERSE
AUTO REVERSE
RECORDING / PLAYBACK B
DUBB.
NOR.
HIGH
DOLBY NR
REV. MODE
CRLS
AUTO BIAS
X. FADE
PAUSE
REC/ARM
CCRS

Cassette Lid (A53-1859-11)
Badge (LOGO) (B43-0301-04)
Front glass A (B10-2083-02)
Metallic cabinet (A01-3215-01)
Front glass B (B10-2084-02)
Cassette Lid (A53-1859-11)
Knob (EJECT) (K29-6087-04)
Escutcheon (FRONT FOOT) (B07-2268-14)
Front panel (A60-0703-01)
Knob (OPERATION, FUNCTION) (K29-6085-02)
Knob (EJECT) (K29-6087-04)


KENWOOD X-F7
STEREO CASSETTE DECK
AC 15V 1A
KENWOOD CORPORATION
1993
SERIAL NO.
DOLBY NOISE REDUCTION AND HX PRO HEADROOM EXTENSION MANUFACTURED UNDER LICENSE FROM DOLBY LABORATORIES LICENSING CORPORATION.
"DOLBY" AND THE DOUBLE-D SYMBOL ARE TRADEMARKS OF DOLBY LABORATORIES LICENSING CORPORATION. HX PRO ORIGINATED BY BANG & OLUFSEN.
"DOLBY", THE DOUBLE-D SYMBOL, AND "HX PRO" ARE TRADEMARKS OF DOLBY LABORATORIES LICENSING CORPORATION.
SEE INSTRUCTION MANUAL FOR CONNECTION.
VOIR LE MANUEL D'INSTRUCTION POUR LE RACCORDEMENT
SYSTEM CONTROL
CONNECT WITH DP-F7 OR DP-MF7
CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN
ATTENTION
RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR

Rectangular receptacle (E58-0311-05)
Rectangular receptacle (E58-0006-05)
Foot (REAR) (J02-0366-15)

Refer to parts list on page 26.

PRECAUTIONS FOR REPAIR

- Since power of this equipment is supplied by **A-F7** of the amplifier of the stereo system, these equipment and the jig **(PS-94UA)** are needed when doing the repairs.
- Refer to **RXD-C3/C3L (B51-4869-00)** service manual, if you want to know more information of **CASSETTE MECHANISM DESCRIPTION**.

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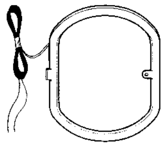
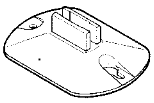
PARTS LIST 26
SPECIFICATIONS .... Back cover

Accessories (Speaker cords are packed with the Speakers. All other accessories are packed with the Tuner unit.)

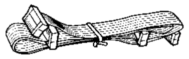
AM loop antenna assy (1)
(T90-0195-05)



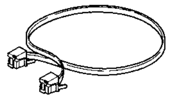
Loop antenna stand
(J19-3645-05)



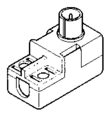
Parallel cord (Thick :1, Thin :1)
(E30-2738-05)



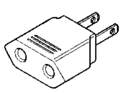
(E35-1063-05)



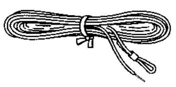
Antenna adaptor (1)
(T90-0198-05)
TEG type only



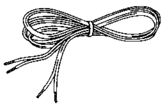
AC plug adaptor (1)
(E03-0115-05)
M type only



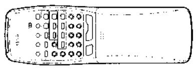
FM indoor antenna (1)
(T90-0801-05)



Speaker cord (2)
(E30-5120-08)

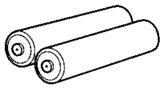


Remote control unit (1)
(X94-1070-00 : RC-F7)



Battery cover : (F07-0721-33)

Batteries (R03/AAA) (2)



System configuration

System	Amplifier	Tuner	CD Player	Deck	Speaker	System Carton Box (Parts Mo.)
UD-703	A-F7	C-F7	DP-F7	**X-F7**	LS-F5 (KP) / LS-F7 (Other)	--
UD-753	A-F7	C-F7	DP-MF7	**X-F7**	LS-F5 (KP) / LS-F7 (Other)	H60-0307-04 (K) / H60-0306-04 (PR)
UD-713	A-F7	C-F7	DP-F7	**X-F7**	LS-F7	H60-0304-04
UD-763	A-F7	C-F7	DP-MF7	**X-F7**	LS-F7	H60-0343-04

Instruction manual

UD-703/753

ENGLISH	B60-2066-00	KPT
FRENCH	B60-2067-00	PE
GERMAN	B60-2068-00	EG
DUTCH	B60-2069-00	E
ITALIAN	B60-2070-00	E
SPANISH	B60-2071-00	RE
For RDS	B60-2074-00	TEG

UD-713/763

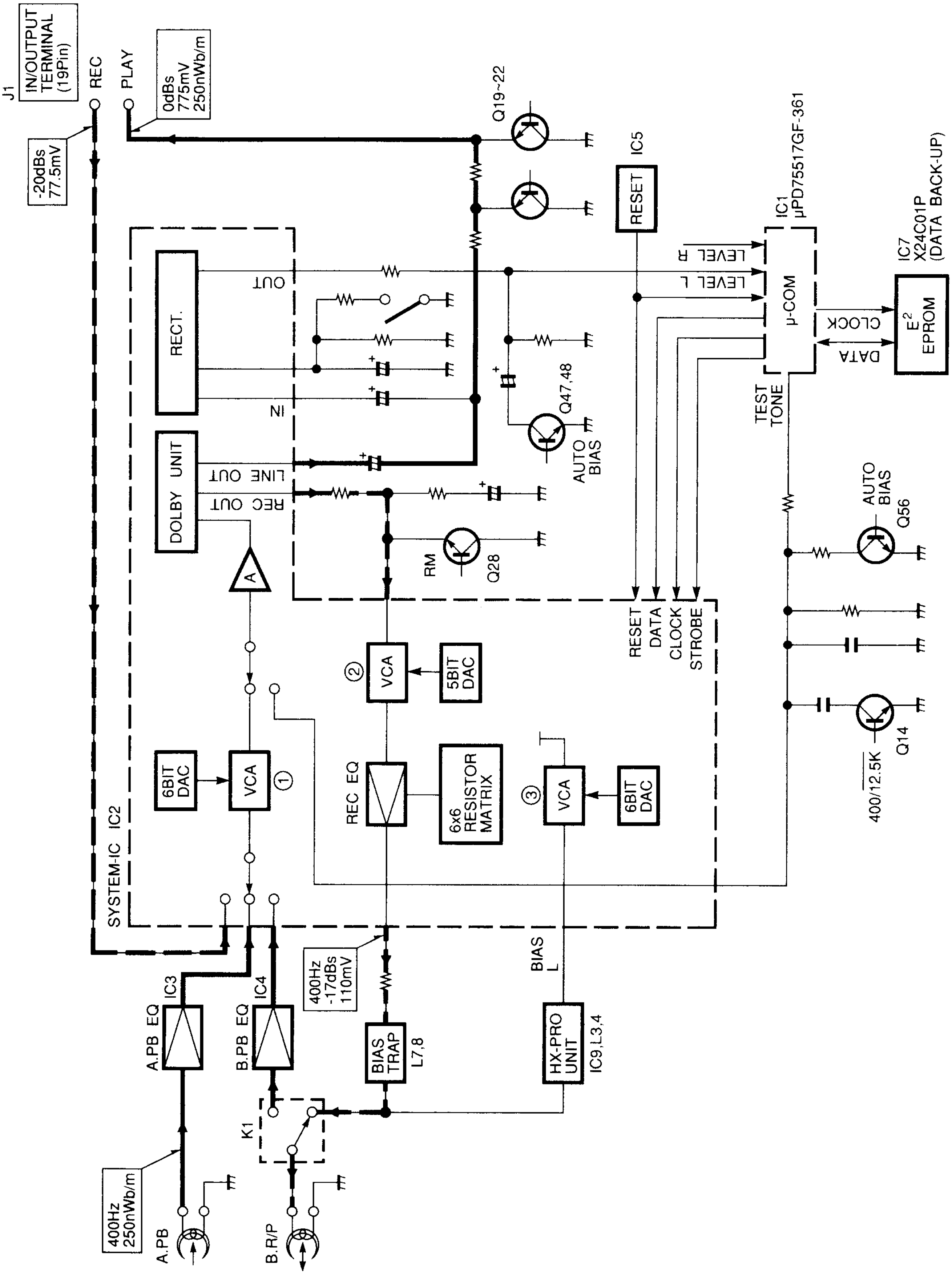
ENGLISH	B60-2259-00	YMX
SPANISH	B60-2260-00	M
CHINESE	B60-2072-00	M
TAIWANESE	B60-2073-00	M

Caution

Beware of condensation
When water vapor comes into contact with the surface of cold material, water drops are produced. If condensation occurs, correct operation may not be possible, or the unit may not function correctly. This is not a malfunction, however, and the unit should be dried. (To do this, turn the POWER switch ON and leave the unit for several hours.)

Be especially careful in the following conditions:
- When the unit is brought from a cold place to a warm place, and there is a large temperature difference.
- When a heater starts operating.
- When the unit is brought from an air-conditioned place to a place of high temperature with high humidity.
- When there is a large difference between the internal temperature of the unit and the ambient temperature, or in conditions where condensation occurs easily.

BLOCK DIAGRAM


J1
IN/OUTPUT TERMINAL (19Pin)
REC
PLAY
-20dBs 77.5mV
0dBs 775mV 250nWb/m
Q19~22
IC5
RESET
IC1 µPD75517GF-361
IC7 X24C01P (DATA BACK-UP)
µ-COM
E2 EPROM
CLOCK
DATA
LEVEL R
LEVEL L
TEST TONE
RECT.
OUT
IN
Q47,48
AUTO BIAS
DOLBY UNIT
LINE OUT
REC OUT
A
RM
Q28
AUTO BIAS
Q56
RESET
DATA
CLOCK
STROBE
②
VCA
5BIT DAC
6BIT DAC
VCA
①
REC EQ
6x6 RESISTOR MATRIX
③
VCA
6BIT DAC
Q14
400/12.5K
SYSTEM-IC IC2
BIAS L
400Hz -17dBs 110mV
IC3
A.PB EQ
IC4
B.PB EQ
BIAS TRAP
L7,8
HX-PRO UNIT
IC9,L3,4
K1
400Hz 250nWb/m
A.PB
B.R/P

CIRCUIT DESCRIPTION

1. Deck Microprocessor : µPD75517GF-361 (X28- IC1)

1-1. Explanation of functions

Microprocessor (µPD75517GF-361) for controlling the deck (X-F7) of UD-703,713,753,763

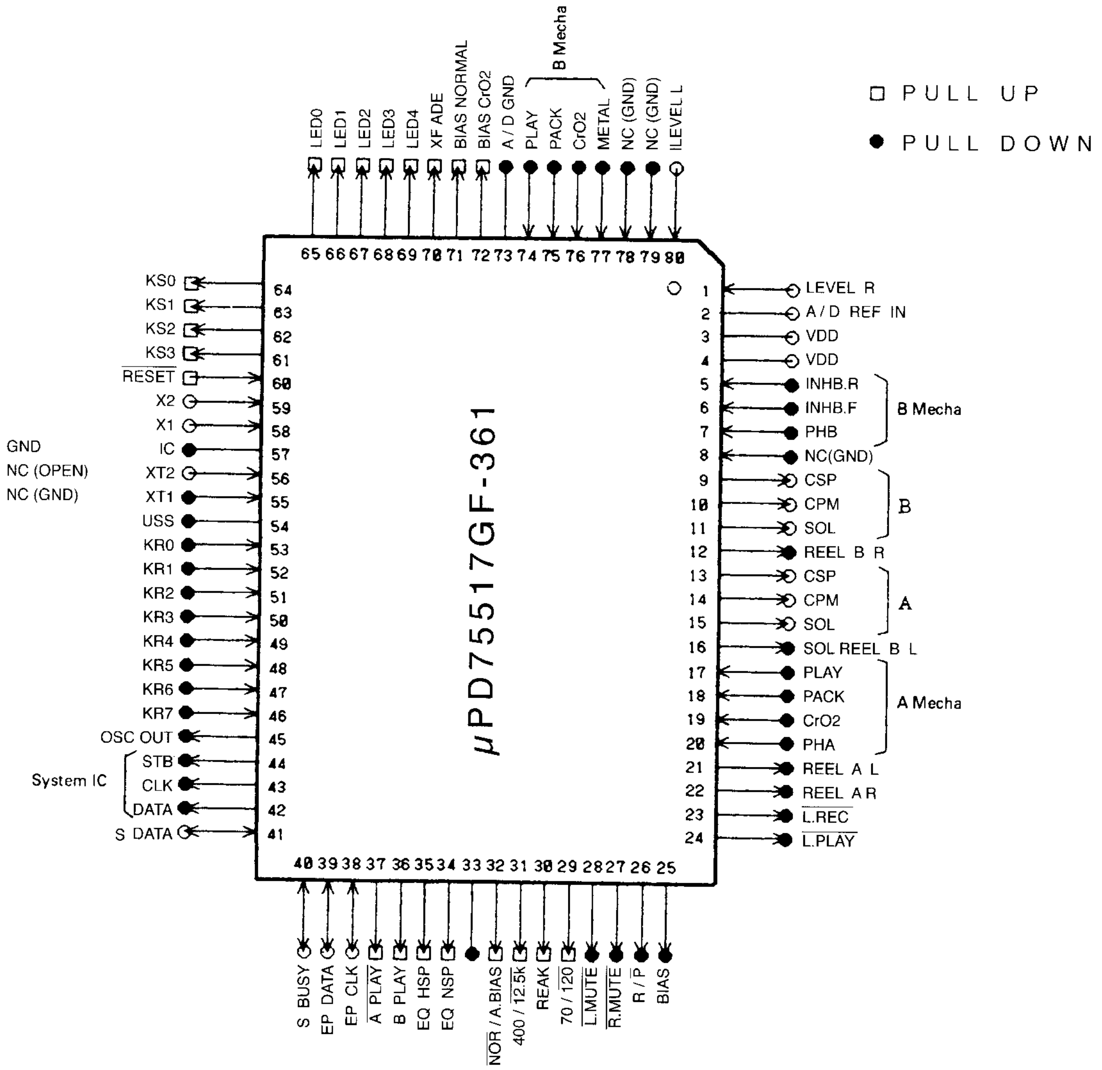
- **Features**

1) Double reverse system. One deck (B deck) for recording and playing.
2) Equipped with CCRS, double-speed CCRS, cross fading and CRLS.
3) Equipped with DPSS. FF search, RWD search, 1 tune repeat, RWD play, auto REC mute, dash and play, REREC standby.
4) Normal dubbing, high-speed dubbing.
5) Electronic volume control.
6) Relay play.
7) Timer play and REC.
8) Dolby NR B/C.
9) Memory for each REC volume source.
10) Auto biasing.
11) Edit, AI edit.
12) Multi-edit (Single CD), program edit (Magazine).

- **Objects of control**

1) Mechanism: D40-1400-*5 (A mechanism)
D40-1401-*5 (B mechanism)
2) IC: System IC HA12167FB
3) Indication: LED
4) Recording/Playing circuit unit

1-2. Terminal connection diagram



□ PULL UP
● PULL DOWN
µPD75517GF-361
65 LED0
66 LED1
67 LED2
68 LED3
69 LED4
70 XF ADE
71 BIAS NORMAL
72 BIAS CrO2
73 A/D GND
74 PLAY
75 PACK
76 CrO2
B Mecha
77 METAL
78 NC (GND)
79 NC (GND)
80 LEVEL L
1 LEVEL R
2 A/D REF IN
3 VDD
4 VDD
5 INHB.R
6 INHB.F
7 PHB
B Mecha
8 NC(GND)
9 CSP
10 CPM
11 SOL
B
12 REEL B R
13 CSP
14 CPM
15 SOL
A
16 SOL REEL B L
17 PLAY
18 PACK
19 CrO2
20 PHA
A Mecha
21 REEL A L
22 REEL A R
23 L.REC
24 L.PLAY
25 BIAS
26 R/P
27 R.MUTE
28 L.MUTE
29 70/120
30 REAK
31 400/12.5k
32 NOR/A.BIAS
33 EQ NSP
34 EQ HSP
35 B PLAY
36 A PLAY
37 EP CLK
38 EP DATA
39 S BUSY
41 S DATA
42 DATA
43 CLK
44 STB
System IC
45 OSC OUT
46 KR7
47 KR6
48 KR5
49 KR4
50 KR3
51 KR2
52 KR1
53 KR0
54 USS
55 XT1 NC (GND)
56 XT2 NC (OPEN)
57 IC GND
58 X1
59 X2
60 RESET
61 KS3
62 KS2
63 KS1
64 KS0

CIRCUIT DESCRIPTION

1-3. Terminal function

Pin No.	Pin name	I/O	Description
1	LEVEL R	I	CCRS, CRLS, DPSS Rch signal input.
2	AVREF	–	A/D converter reference voltage input (VDD).
3, 4	VDD	–	Positive power supply terminals.
5	INHB R	I	B mechanism RVS recording inhibit detection. L : Inhibited
6	INHB F	I	B mechanism FWD recording inhibit detection. L : Inhibited
7	PHB	I	B mechanism turn detection input.
8	NC	O	Unused (GND).
9	CSP B	O	B capstan motor changeover. H : Normal, L : High speed
10	CPM B	O	B capstan motor control. H : ON
11	SOL B	O	B solenoid control. H: ON
12	BREEL R	O	B reel LED control (Right).
13	CSP A	O	A capstan motor changeover. H : Normal, L : High speed
14	CPM A	O	A capstan motor control. H : ON
15	SOL A	O	A solenoid control. H : ON
16	BREEL L	O	B reel LED control (Left).
17	PLAY A	I	A mechanism head position detection. H : PLAY
18	PACK A	I	A mechanism half detection. H : Half detected
19	CrO$_2$ A	I	A mechanism chrome tape detection. H : Normal
20	PHA	I	A mechanism turn detection input.
21	AREEL L	O	A reel LED control (Left).
22	AREEL R	O	A reel LED control (Right).
23	$\overline{\text{L. REC}}$	O	Input/Output line control. L : REC
24	$\overline{\text{L. PLAY}}$	O	Input/Output line control. L : PLAY
25	BIAS	O	Bias ON/OFF control. H : ON
26	R/$\overline{\text{P}}$	O	B mechanism REC/PLAY changeover. H : REC
27	$\overline{\text{R MUTE}}$	O	REC mute control. L : ON
28	$\overline{\text{L MUTE}}$	O	Line mute control. L : ON
29	70/$\overline{\text{120}}$	O	Bias changeover. H : 70µs
30	READ	O	ON in auto bias play. H : ON
31	400/$\overline{\text{12.5K}}$	O	Rectangular wave filter changeover. H : 400Hz
32	$\overline{\text{NOR}}$/A. BIAS	O	OSC oscillation ON/OFF control. H : ON
33	Vss	–	GND.
34	EQ NSP	O	REC EQ SPEED changeover. H : Normal speed
35	EQ HSP	O	REC EQ SPEED changeover. H : High speed
36	$\overline{\text{B PLAY}}$	O	B head changeover. L : B head ON
37	$\overline{\text{A PLAY}}$	O	A head changeover. L : A head ON
38	EPROM CLK	I/O	EPROM clock input/output.
39	EPROM DATA	I/O	EPROM data input/output.
40	S BUSY	I/O	Serial busy input/output.
41	S DATA	I/O	Serial data input/output.
42	DATA	O	System IC serial data output.
43	CLK	O	System IC clock output.
44	STB	O	System IC strobe signal input.
45	OSC OUT	O	Rectangular waveform output terminal (400Hz or 12.5kHz).
46~53	KR7~KR0	I	Key return signal input. H : ON
54	Vss	–	GND.
55	XT1	–	Unused (GND).
56	XT2	–	Unused (OPEN).
57	IC	–	Unused (GND).
58, 59	X1, X2	–	Clock oscillation element connecting terminals.
60	$\overline{\text{RESET}}$	I	Reset signal input. L : Reset
61~64	KS3~KS0	O	Key scan signal output. L : Scan
65~69	LED3~LED0, LED4	O	LED drive output. L : Lighting up

CIRCUIT DESCRIPTION

Pin No.	Pin name	I/O	Description
70	XFADE	O	Cross fading control (For erase head control ON/OFF). H : ON
71	BIAS NORM	O	REC bias normal. H : Normal
72	BAIS CrO2	O	REC bias CrO2. H : CrO2
73	AVss	–	A/D converter reference potential input (GND).
74	PLAY B	I	B mechanism head position detection. H : PLAY
75	PACK B	I	B mechanism half detection. H : Half detected
76	CrO2 B	I	B mechanism chrome tape detection. H : Normal
77	METAL	I	B mechanism metal tape detection. L : Metal
78, 79	NC	I	Unused (GND).
80	LEVEL L	I	CCRS, CRLS, DPSS Lch signal input.

1-4. Key matrix

	KS0	KS1	KS2	KS3
KR0	A ▶	A. BIAS	B ●	B ▶
KR1	A ◀	CCRS	HI. DUB	B ▶▶
KR2	A ■	HI. CCRS	❚❚	B ■
KR3	-	-	CRLS	-
KR4	A ▶▶	DIR	ᗡD	B ◀◀
KR5	A ◀◀	X-FADE	NOR. DUB	B ◀
KR6	VOLMAX	-	CALIB	LIMITER
KR7	TEST1	A. ADJUST	M. ADJUST	-

Note :

A. ADJUST	: For self-adjustment
M. ADJUST	: For manual adjustment
VOLMAX	: For electronic VOL MAX
LIMITER	: Self-adjustment range limiting mode (When shorted)
(CALIB)	: 400Hz oscillation keep in sensitivity correction mode

1-5. LED matrix

	KS0	KS1	KS2	KS3
LED0	⊃	HI. CCRS	CRLS	ᗡD C
LED1	⇄	CCRS	NOR. DUB	ᗡD B
LED2	A ◀	-	B ●	B ▶
LED3	A ▶	X-FADE	B ❚❚	B ◀
LED4		A. BIAS	HI. DUB	-

2. Test Mode

2-1. Test 1 mode (For body)

- **Setting**

Setting 1.	Turn on the power with the test pins TP7 and TP10 of (X28-) shorted by a diode. (⑩ ─▷|─ ⑦) The direction is set with the mode.

- **Resetting**

Resetting 1.	Push the pause key.
Resetting 2.	Disconnect the plug.

If either of the above resetting methods 1 and 2 is taken, the test mode is reset perfectly, regardless of the setting of the diode jig. The back-up system is initialized.

- **Specifications**

The system is set in the test mode, regardless of the position of the switches and mounting of a tape. Even if the head is raised, the following operation is performed after the initial setting.

1) Initial setting

The REC level is set to the center (–15dB).

After the power is turned on, all the lamps are turned on for 1.5 sec.

2) 4-sec REC

If the REC key is pushed, the system records for 4 sec. Then, it rewinds to the REC starting position and plays back automatically.

The operation of the REC key is accepted infinitely.

If the REC key is pushed during the 4-sec REC operation, the system records further for 4 sec, then returns to the starting position of the first 4-sec REC operation and plays back.

CIRCUIT DESCRIPTION

3) Play for tape speed adjustment (Common to A and B mechanisms)

If the FF key is pushed, the system plays forward at the high speed.

If the FWD PLAY key pushed, the system plays forward at the normal speed.

If the two keys are pushed alternately while the mechanism is playing, the speed is changed without lowering the head.

4) Increase and decrease of electronic volume

If the HI-DUB key is pushed, the volume is increased (-∞ → -15dB → 0dB).

If the NOR-DUB key is pushed, the volume is decreased (0dB → -15dB → -∞).

5) NOR-CCRS (Confirmation of lowering of REC volume level)

If the NOR-CCRS key is pushed, recording is paused. If an excessive input is applied, the REC level is lowered.

The LED flashes while this function is turned on.

6) 4-sec DOLBY REC (For checking recording frequency)

If the HI-CCRS key is pushed, the chrome SW or metal SW is detected, then the following operation starts.

When a normal tape is used

The system records for 4 sec with the dolby turned off, then returns to the REC starting position and plays back.

The system plays back with the dolby turned off.

When a chrome tape is used

The system records for 4 sec with the dolby C turned on, then returns to the REC starting position and plays back.

The system plays back with the dolby C turned on.

When a metal tape is used

The system records for 4 sec with the dolby B turned on, then returns to the REC starting position and plays back.

The system plays back with the dolby B turned on.

After the 4-sec play, the system continues playing with the current dolby setting.

If the STOP key is pushed, the operation is stopped and the dolby is turned off.

The system enters this operation mode when the HI-CCRS key is pushed even it is recording.

7) Detection of wrong recording by B mechanism

Insert a tape, the recording inhibiting claw of which is broken, in the B deck, and check the operation of the REC INH. SW by the PLAY SW LED of the B deck.

B PLAY LED
(REV) (FWD)
◀ ▶ : Normal.
◀ ▷ : FWD REC INH. SW is broken.
◁ ▶ : RVS REC INH. SW is broken.

The above operation must be performed even if there is not a half.
(◁ ▷ : Lit [ON], ◀ ▶ : OFF)

8) Check of leaf SW of A mechanism

Check the operation of the Half detecting SW and Chrome detecting SW by the PLAY SW LED of the A deck.

A PLAY LED
(REV) (FWD)
◁ ▶ : Chrome detecting SW ON, Half detecting SW OFF.
◁ ▷ : Chrome detecting SW ON, Half detecting SW ON.
◀ ▷ : Chrome detecting SW OFF, Half detecting SW ON.
◀ ▶ : Chrome detecting SW OFF, Half detecting SW OFF.
(◁ ▷ : Lit [ON], ◀ ▶ : OFF)

2-2. Initial condition

Item	Condition	Item	Condition
Dolby ON/OFF	OFF	Electronic volume	-15dB
R/P	PLAY	OSC OUT	OFF
A play	SET	MPX ON/OFF	ON
B play	SET	XFADE	OFF
EQ NOR speed	ON	NOR/A. BIAS	SET
EQ HI speed	OFF	70/120	120
REC MUTE	ON	SOL	OFF
LINE MUTE	ON	CPM	ON (1 sec) → OFF
BIAS	OFF	CSP	Normal
Selector	TUNER		

- **Initial setting condition**

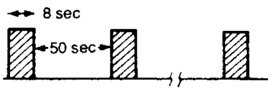
After setting in the adjustment mode (Automatic adjustment, Self adjustment) or test mode (1, Synchro), disconnect the power plug and connect it again, and the system is set under the initial condition.

ADJUSTMENT

ADJUSTMENT PROCEDURE

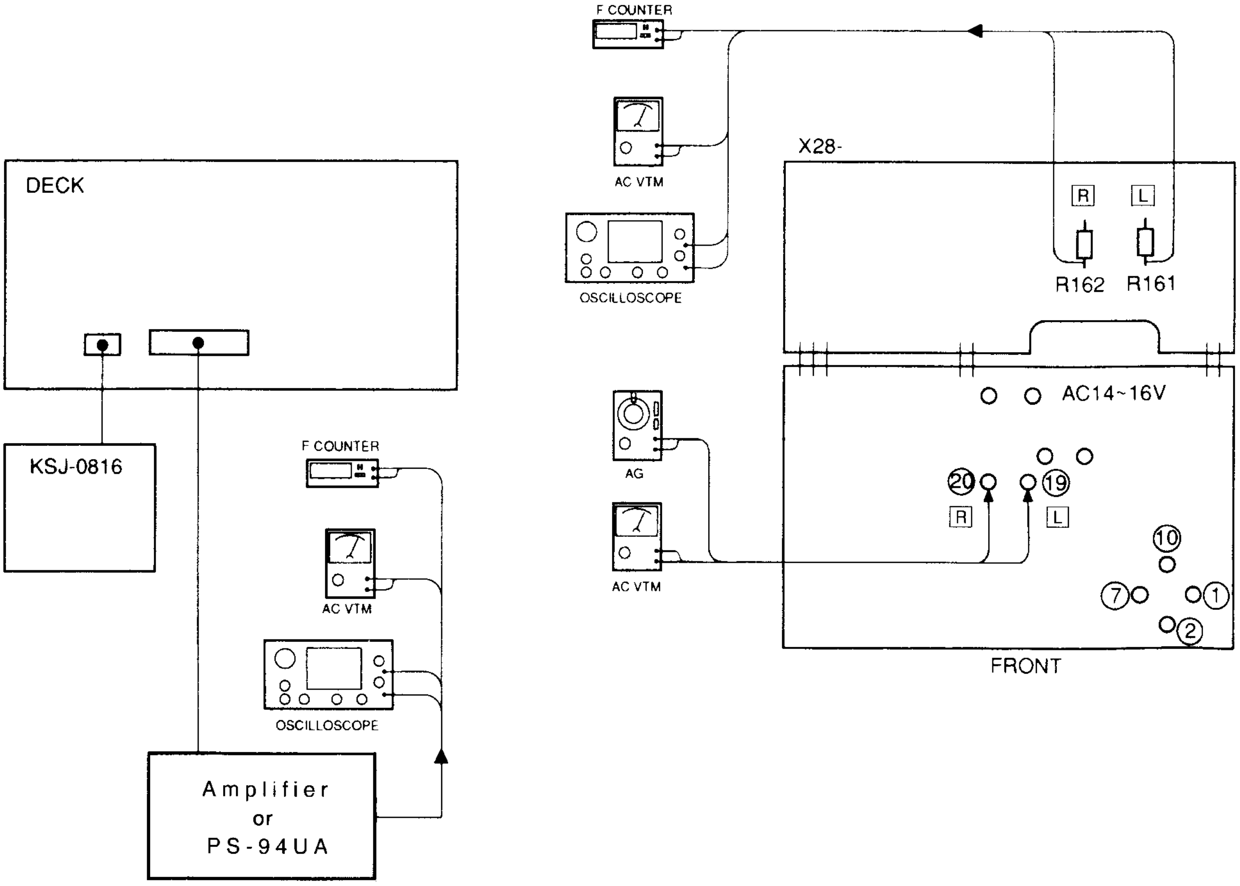
(1) Supply AC 14-16 V power from the main amplifier or jig.

(2) In the case of automatic adjustment, prepare a Dolby level tape (TCC−130 or MTT−150) as well as a tape equivalcnt to SCC−2280.

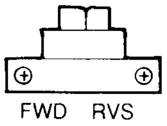
DOLBY LEVEL CALIBRATION	TCC−130 MTT−150	DOLBY B · TYPE TONE 200 nwb/m	DOLBY B · TYPE TONE
DOLBY LEVEL + Alignment	SCC−2280	DOLBY B−TYPE TONE 200 nwb/m	

(3) If a synchronization check jig is available, connect it (KSJ-0816)

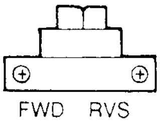
Connection diagram


F COUNTER
AC VTM
OSCILLOSCOPE
X28-
R
L
R162
R161
DECK
KSJ-0816
F COUNTER
AC VTM
OSCILLOSCOPE
Amplifier
or
PS-94UA
AC14~16V
AG
AC VTM
⑳
⑲
R
L
⑩
⑦
①
②
FRONT

ADJUSTMENT

No.	ITEM	INPUT SETTING	OUTPUT SETTING	CASSETTE TAPE DECK SETTING	ALIGNMENT POINTS	ALIGN FOR	FIG.
Unless otherwise specified, set the respective switches as follows: TAPE: NORMAL DOLBY: OFF I Cassette mechanism unit (Adjustment of the REC/PLAY head)						**0dBs=0.775V**	
<1>	Demagnetization and cleaning	—	—	Power:OFF Demagnetization, cleaning, PLAY	Recording head, erase head, capstan, pinch roller	Demagnetize the REC/PLAY head with the head eraser. Clean the REC/PLAY head, erase head, capstan and pinch roller using a cotton swab slightly dampped with alcohol.	
<2>	Azimuth of the REC/PLAY head	SCC-1727 TCC-153 MTT-114 10kHz, -10dB	—	PLAY		Adjust the output to maximum and adjust the azimuth adjustment screw for the Lissajous waveform pattern of the oscilloscope to become close to a 45° straight line.	
II PC BOARD ADJUSTMENT							
<1>	TAPE SPEED (NORMAL)	—	—	—	—	—	

AJUSTES

Núm.	ÍTEM	AJUSTES DE ENTRADA	AJUSTES DE SALIDA	AJUSTES DEL DECK DE CASETES	PUNTOS DE ALINEACIÓN	ALINEACIÓN PARA	FIG.
A menos que se especifique lo contrario, el ajuste de los controles respectivos es el siguiente: **CINTA: NORMAL, DOLBY: DESACTIVADO 0dBs=0.775V** **I. UNIDAD DEL MECANISMO DEL CASETE (Adjuste de la cabeza grabadora/reproductora [REC/PLAY] .)**							
[1]	DESMAGNETIZACIÓN Y LIMPIEZA	–	–	ALIMENTACIÓN : DESCONECTADA Limpieza, Desmagnetización, Reproducción	Cabeza grabadora Cabeza borradora Eje de arrastre Rodillo compresor	Desmagnetice la cabeza Grabadora/Reproductora con el borradora de cabezas. Limpie la cabeza Grabadora/ Reproductora, cabeza borradora, eje de arrastre, y rodillo compresor utilizando un palillo de cabeza de algodón Ligeramente humedecido en alcohol.	
[2]	ACIMUT DE LA CABEZA GRABADORA/ REPRODUCTORA	SCC-1727 TCC-153 MTT-114 10kHz, –10dB	–	REPRODUCCIÓN		Ajuste la salida al nivel máximo, y gire el tornillo de ajuste del acimut hasta que el patrón de forma de onda de lissajous del osciloscopio se acerque a una línea recta de 45°.	
II. Ajuste de la tarjeta de circuito impreso							
[1]	VELOCIDAD DE LA CINTA (NORMAL)	–	–	–	–	–	

ADJUSTMENT

PB LEVEL, REC LEVEL ADJUSTMENT

1 In the case of automatic adjustment (Self adjustment)

● Lit (ON) ○ FLICKERING × OFF

	STEPS OF PROCEDURE	LED INDICATION STATE									
1	Turn the Power OFF										
2	Enter TCC−130 in DECK A Enter SCC−2280 in DECK B										
3	After turning the power ON, enter E 050 H or short circuit TP$\boxed{10}$-▷|-$\boxed{7}$, and then turn the power ON. (The operation starts automatically.)										
4	DECK A playback level adjustment.		CCRS-HIGH	CCRS-NOR	AUTO-BIAS	X-FADE	DUBB-HIGH	DUBB-NOR	CRLS	II	●
		(Adjustment under way)	●	●	○	○	×	×	×	×	×
		(Finished)	●	●	○	●	×	×	×	×	×
5	DECK B playback level adjustment.	(Adjustment under way)	●	●	○	●	○	×	×	×	×
		(Finished)	●	●	○	●	●	×	×	×	×
6	Recording level adjustment.	(Recording under way)	●	●	○	●	●	○	×	×	●
		(Adjustment under way)	●	●	○	●	●	○	×	×	×
		(Finished)	●	●	○	●	●	●	×	×	×
7	Recording bias adjustment.	(Recording under way)	●	●	○	●	●	●	○	×	●
		(Adjustment under way)	●	●	○	●	●	●	○	×	×
		(Finished)	●	●	●	●	●	●	●	×	×
8	The adjustment is finished when the 7 light emitting diodes (LED) of CCRS−HIGH←→CRLS are lit. (E080H is outputted at this time F090H is outputted when there is error.) The operation mode returns to normal when the power is turned OFF or when the PAUSE KEY is pushed.										

List of codes of the synchro test mode

- Deck synchro test code (E 0××H)
- Synchro test ON

  Synchro test ON code (40 H)
- Synchro test OFF

  Synchro test OFF code (41 H)

Normal operation is carried out in the following modes.

	A	B
FWD PLAY	10 H	20 H
PVS PLAY	11 H	21 H
FF	12 H	22 H
RWD	13 H	23 H
STOP	14 H	24 H
REC		25 H
PAUSE		26 H
FWD REC		2 CH
RVS REC		2 DH

DOLBY OFF (37 H) ······DOLBY is turned OFF.

DOLBY B ON (38 H)······DOLBY B is turned ON.

DOLBY C ON (39 H)······DOLBY C is turned ON.

DIRECTION ⇌ (3 AH)······The operation is switched to the one-way mode.

DIRECTION ⊐ (3 BH)······The operation is switched to the reverse mode.

DIRECTION ⊂⊃ (3 CH)······The operation is switched to the endless mode.

CCRS	30 H
H.CCRS	31 H
X−FADE	32 H
A.BIAS	33 H
CRLS	34 H
NOR.DUB	35 H
HI.DUB	36 H

ADJUSTMENT

2 Manual adjustment

● Lit (ON) ○ FLICKERING × OFF

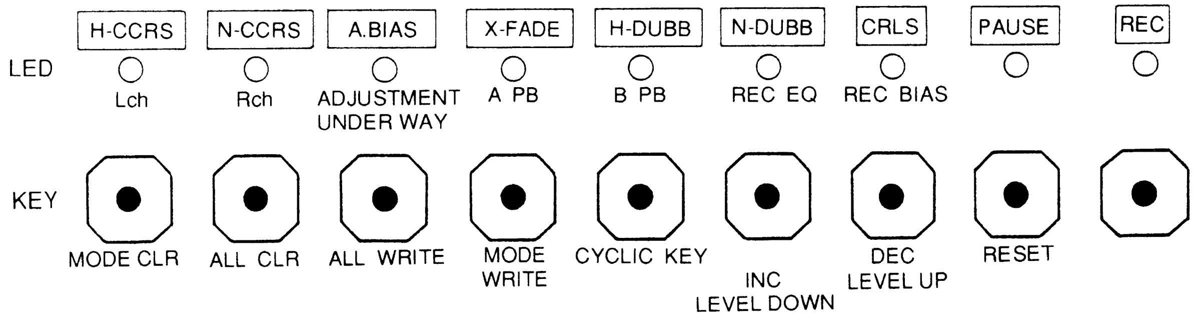
	STEPS OF PROCEDURE	LED INDICATION STATE								
1	Turn the Power OFF									
		CCRS-HIGH	CCRS-NOR	AUTO-BIAS	X-FADE	DUBB-HIGH	DUBB-NOR	CRLS	II	●
2	After turning the power ON, enter E051H or short circuit TP 2 -▷|- 7, and then turn the power ON.	●	×	○	●	×	×	×	×	×
3	Enter TCC−130 in DECK A and PLAY.									
4	DECK A Lch LEVEL adjustment. Same as in the case of P.B — DUBB NOR (DOWN) / CRLS (UP) Adjust the output level to −1 dBs by means of the UP/DOWN KEY. TCC-130 200 nwb/m - −1 dBs (690 mV) 250 nwb/m - 0 dBs 160 nwb/m - −4 dBs ※When using 160 nwb/m or 250 nwb/m tape, adjust to −4 dB and 0 dB respectively.									
5	Push the DUBB HIGH KEY. Adjust the DECK A Rch LEVEL.	×	●	○	●	×	×	×	×	×
6	Push the DUBB HIGH KEY. Enter TCC−130 in DECK B, and PLAY. Adjust the B Lch LEVEL.	●	×	○	×	●	×	×	×	×
7	Push the DUBB HIGH KEY. Adjust the B, Rch LEVEL.	×	●	○	×	●	×	×	×	×
	As the PLAY/REC select IC is on the PLAY side even during recording in the manual adjustment mode, the playback or recording monitor is output from the deck. Due to this, connect TP 19 and 20 of the AG output and input the recording. —REC Adjustment—									
8	Push the DUBB HIGH KEY (Lch REC LEVEL). Load the tape to be recorded in the DECK B (TDK AC-223). Connect AG (1 kHz) with TP 19.	●	×	○	×	×	●	×	×	×
	Push the REC KEY to start the recording, and adjust AG for the output to become −10 dBs.	●	×	○	×	×	●	×	×	●
	Play the recorded tape back, and make sure that the 1 kHz output is −10 dBs. DUBB NOR (DOWN) / CRLS (UP) Adjust the output to −10 dBs by means of the UP/DOWN KEY. (Each stop corresponds to a change of approximately 0.2 dBs)	●	×	○	×	×	●	×	×	×
9	Push the DUBB HIGH KEY Rch REC LEVEL adjustment.	×	●	○	×	×	●	×	×	×
	Connect AG (1 kHz) with TP 20. Push the REC KEY, and adjust AG to obtain −10 dBs.	×	●	○	×	×	●	×	×	●
	Play the recorded tape back, verify whether the output is −10 dBs, and make the required adjustments.	×	●	○	×	×	●	×	×	×

ADJUSTMENT

● Lit (ON) ○ FLICKERING × OFF

	STEPS OF PROCEDURE	LED INDICATION STATE								
10	Push the DUBB HIGH KEY. Lch BIAS adjustment. Connect AG (−10 dBs) with TP 19 and record 1 kHz/10 kHz alternately. Make the required adjustments with the UP/DOWN KEY for the playback outputs of 1 kHz/10 kHz to become the same.	● ●	× ×	○ ○	× ×	× ×	× ×	● ●	× ×	× ●
11	Push the DUBB HIGH KEY. Rch recording BIAS adjustment. Connect AG with TP 20, record 1 kHz/10 kHz alternately, and carry out the required adjustment with the UP/DOWN KEY for the playback outputs to become the same.	× ×	● ●	○ ○	× ×	× ×	× ×	● ●	× ×	× ●
12	Push the AUTO BIAS KEY which is flickering, and send data to the EEPROM.									
13	Reset the adjustment mode by turning the power OFF or by means of the PAUSE key.									

LAYOUT OF THE KEYS AND LED


H-CCRS
N-CCRS
A.BIAS
X-FADE
H-DUBB
N-DUBB
CRLS
PAUSE
REC
LED
Lch
Rch
ADJUSTMENT UNDER WAY
A PB
B PB
REC EQ
REC BIAS
KEY
MODE CLR
ALL CLR
ALL WRITE
MODE WRITE
CYCLIC KEY
INC LEVEL DOWN
DEC LEVEL UP
RESET

PRECAUTIONS FOR ADJUSTMENT

During manual adjustment mode

1. The manual adjustment mode is necessarily started form the adjustment of the A Lch PB.

2. All backup check data are reset.
   When resetting the manual adjustment mode, make sure of pushing the ALL WRITE key in the first place before resetting.
   If the Manual adjustment mode is reset before pushing the ALL WRITE key (before writing the backup check data), the operation starts form the initial state, by assuming that the backup has been destroyed, when the operation is started the next time from any mode other than adjustment.

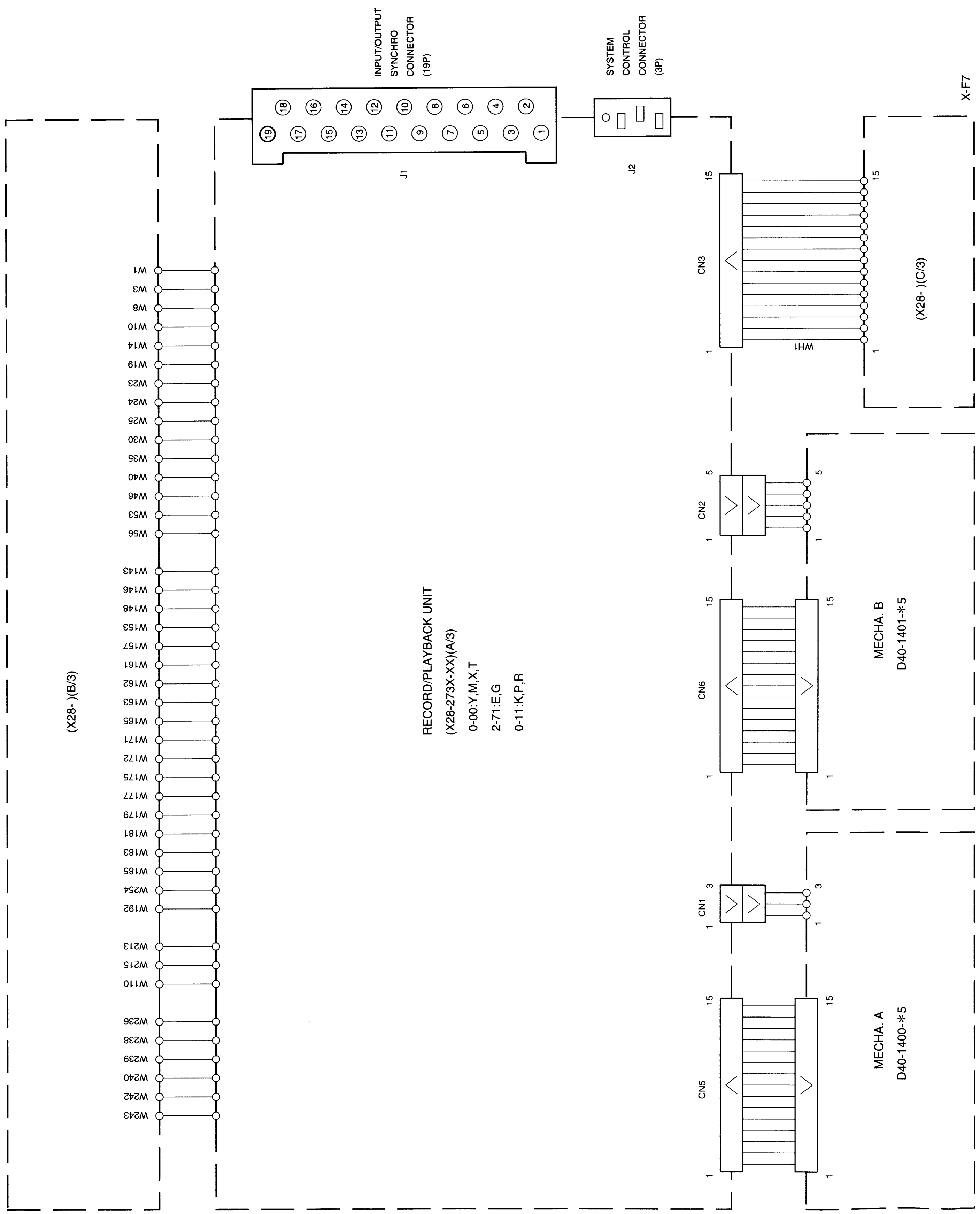
3. No key can be fetched during ALL WRITE or during WRITE by item. (Maximum about 500 ms).

4. Operations in the deck by means of the other keys can be carried out as usual.

5. There is no output of synchronization code for ordinary operation. (Because the synchronization code is used to display the adjustment value).

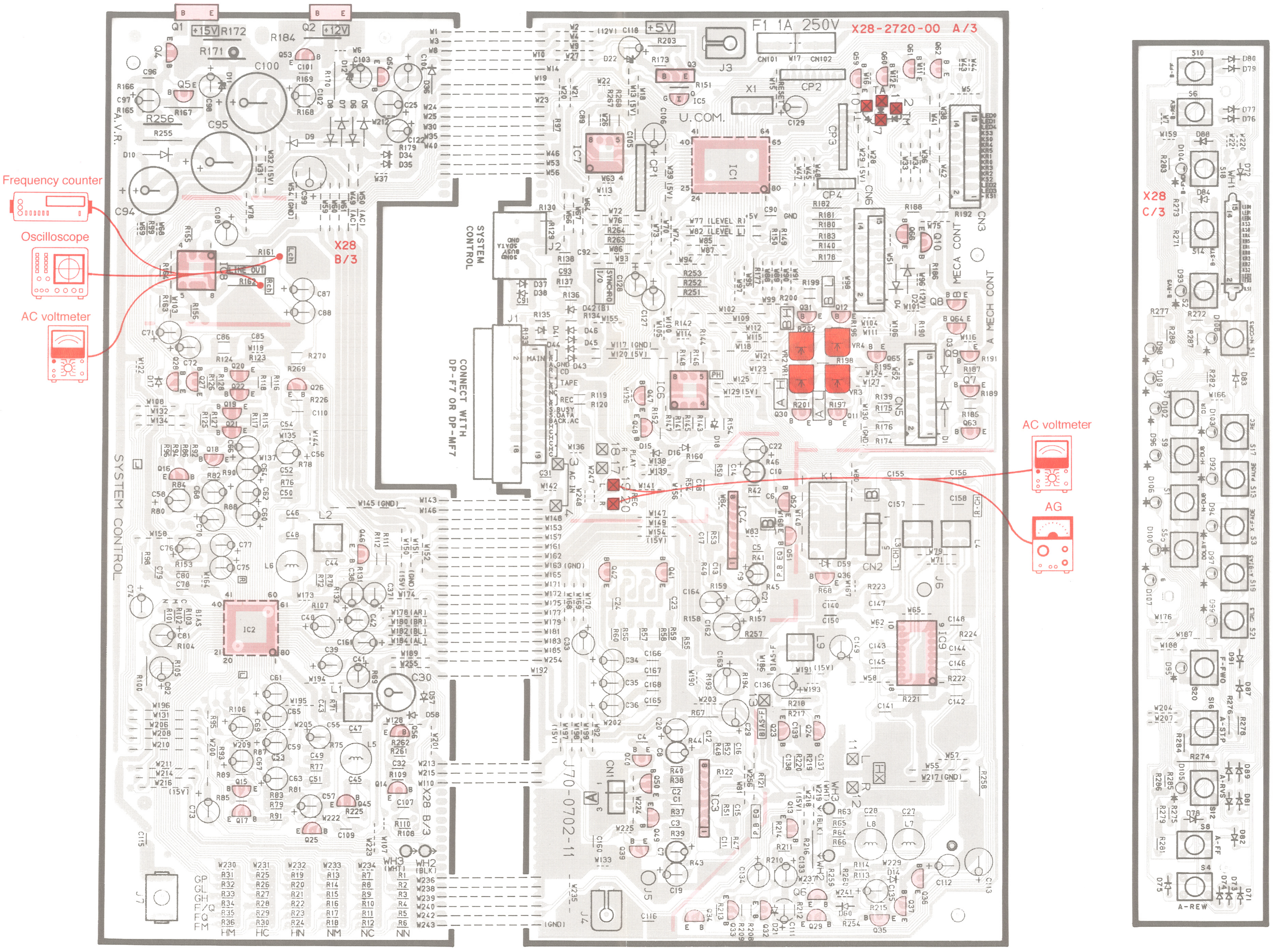
6. Adjust the bias within the limits comprehended from 20 STEP to 50 STEP.
   In the manual adjustment mode the bias setting can be done with a variable value with in the limits comprehended from 0 STEP to 63 STEP.
   In the AUTO BIAS adjustment mode, however, all values of the bias under 20 STEP are rounded up to 20 STEP, and all values over 50 STEP rounded down to 50 STEP when the main unit bias is called, because a limiter is provided as apart of the operations related to AUTO BIAS.

WIRING DIAGRAM


INPUT/OUTPUT SYNCHRO CONNECTOR (19P)
J1
SYSTEM CONTROL CONNECTOR (3P)
J2
X-F7
CN3
(X28-)(C/3)
WH1
CN2
CN6
MECHA. B
D40-1401-*5
CN1
CN5
MECHA. A
D40-1400-*5
RECORD/PLAYBACK UNIT
(X28-273X-XX)(A/3)
0-00:Y,M,X,T
2-71:E,G
0-11:K,P,R
(X28-)(B/3)
W1
W3
W8
W10
W14
W19
W23
W24
W25
W30
W35
W40
W46
W53
W56
W143
W146
W148
W153
W157
W161
W162
W163
W165
W171
W172
W175
W177
W179
W181
W183
W185
W254
W192
W213
W215
W110
W236
W238
W239
W240
W242
W243

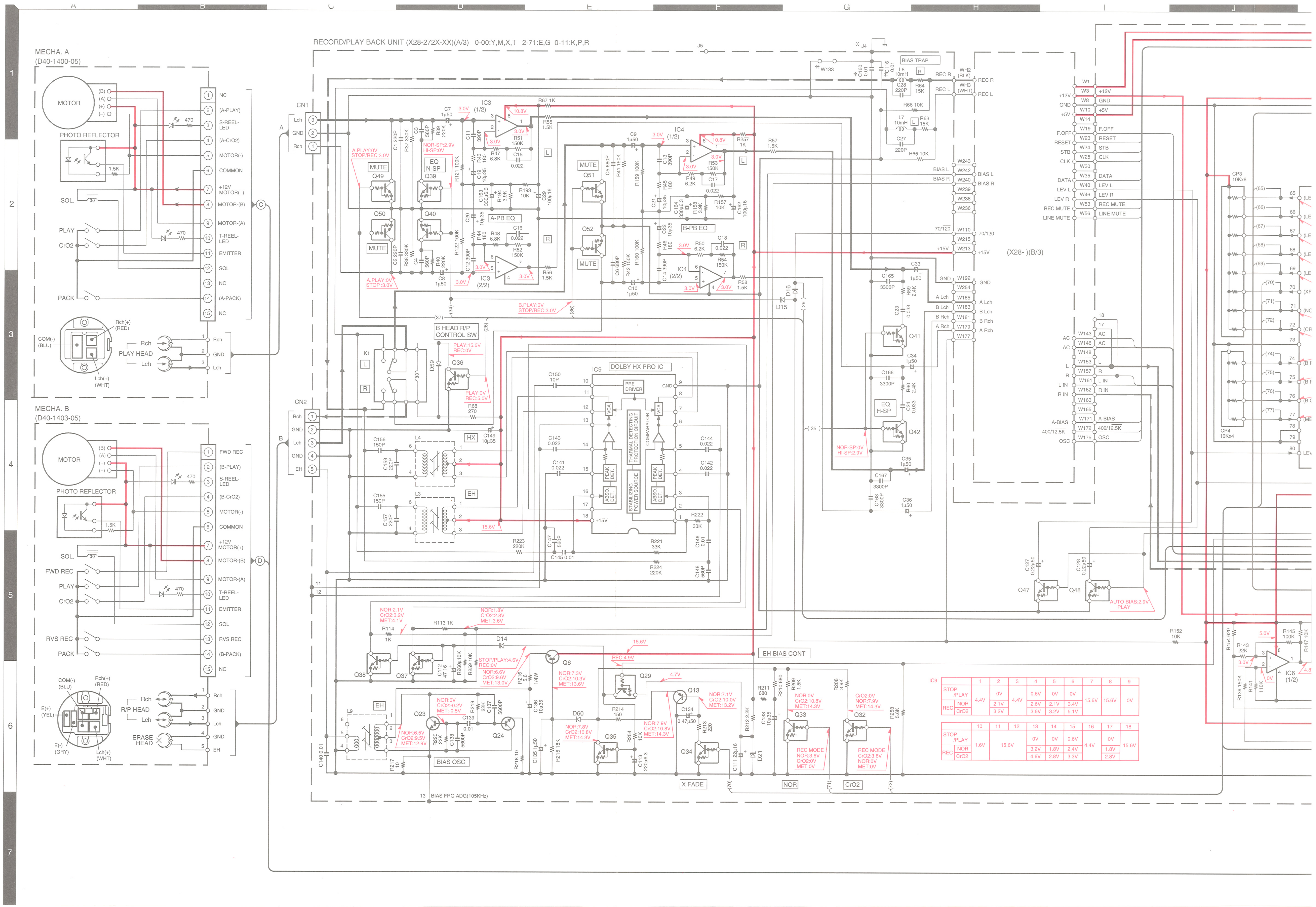
PC BOARD(COMPONENT SIDE VIEW)

RECORD / PLAY UNIT (X28-272X-XX)


Frequency counter
Oscilloscope
AC voltmeter
AC voltmeter
AG
X28 B/3
X28-2720-00 A/3
X28 C/3
F1 1A 250V
SYSTEM CONTROL
CONNECT WITH DP-F7 OR DP-MF7
IC1
IC2
IC7
U.COM.
A.V.R.
LINE OUT
J70-0702-11
MECA CONT
MECH CONT
A-REW
A-FF
A-STP
F-FWD

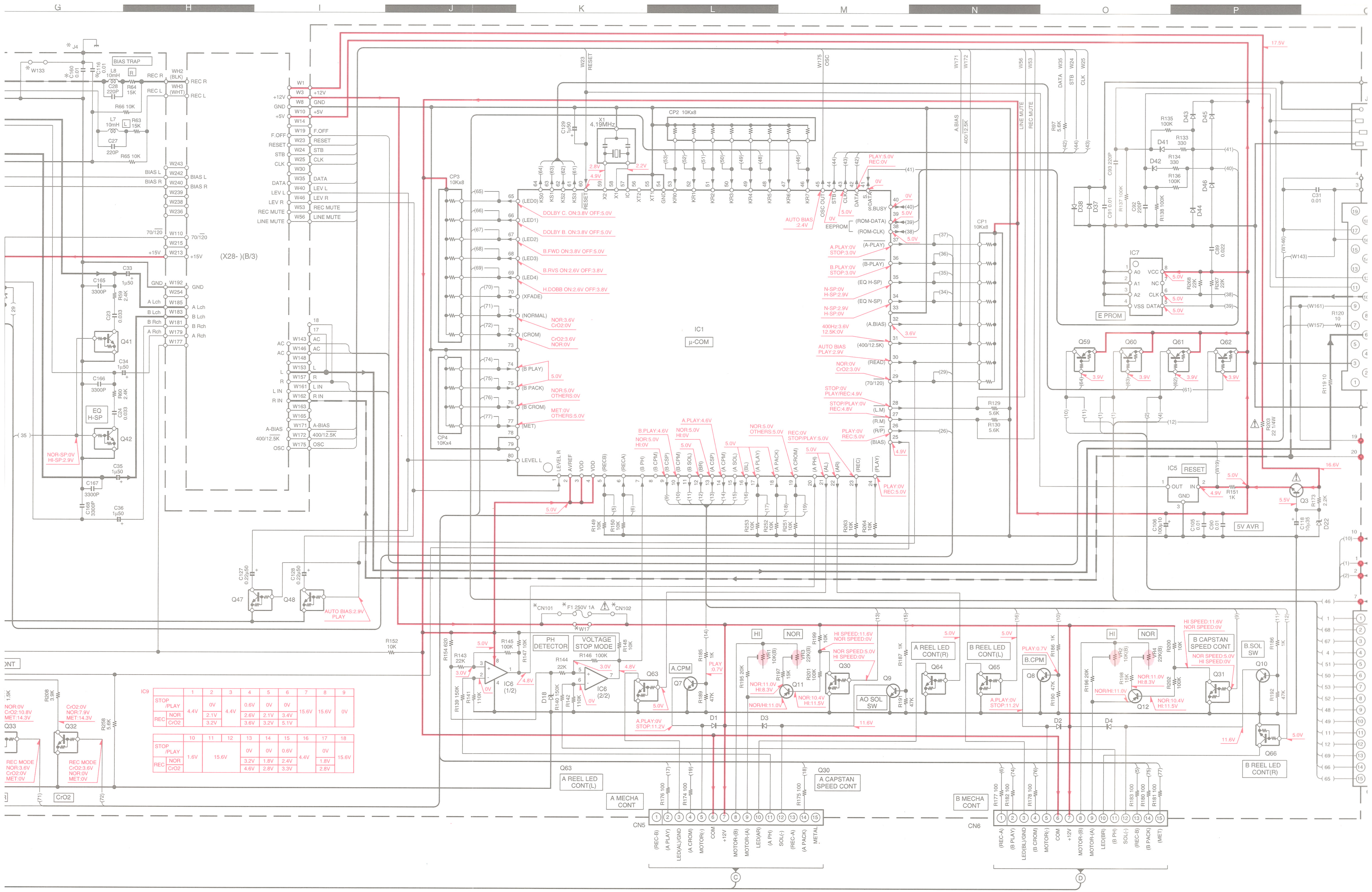
Refer to the schematic diagram for the value of resistors and capacitors.

RECORD/PLAY BACK UNIT (X28-272X-XX)(A/3) 0-00:Y,M,X,T 2-71:E,G 0-11:K,P,R


A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
MECHA. A
(D40-1400-05)
MOTOR
PHOTO REFLECTOR
SOL.
PLAY
CrO2
PACK
COM(-)
(BLU)
Rch(+)
(RED)
Lch(+)
(WHT)
PLAY HEAD
NC
(A-PLAY)
S-REEL-LED
(A-CrO2)
MOTOR(-)
COMMON
+12V MOTOR(+)
MOTOR-(B)
MOTOR-(A)
T-REEL-LED
EMITTER
SOL
(A-PACK)
MECHA. B
(D40-1403-05)
FWD REC
RVS REC
(B-PLAY)
(B-CrO2)
(B-PACK)
R/P HEAD
ERASE HEAD
E(+)
(YEL)
E(-)
(GRY)
CN1
CN2
IC3
IC4
IC9
DOLBY HX PRO IC
PRE DRIVER
VCA
THERMAL DETECTING PROTECTION CIRCUIT
COMPARATOR
STABILIZING POWER SOURCE
PEAK DET
ABSO DET
A-PB EQ
B-PB EQ
EQ N-SP
EQ H-SP
MUTE
B HEAD R/P CONTROL SW
HX
EH
EH BIAS CONT
BIAS OSC
BIAS TRAP
X FADE
NOR
CrO2
REC R
REC L
BIAS L
BIAS R
A Lch
B Lch
B Rch
A Rch
(X28-)(B/3)
F.OFF
RESET
STB
CLK
DATA
LEV L
LEV R
REC MUTE
LINE MUTE
A-BIAS
400/12.5K
OSC
AUTO BIAS:2.9V PLAY
13 BIAS FRQ ADG(105KHz)

IC9		1	2	3	4	5	6	7	8	9
STOP /PLAY		4.4V	0V	4.4V	0.6V	0V	0V	15.6V	15.6V	0V
REC	NOR		2.1V		2.6V	2.1V	3.4V			
	CrO2		3.2V		3.6V	3.2V	5.1V			

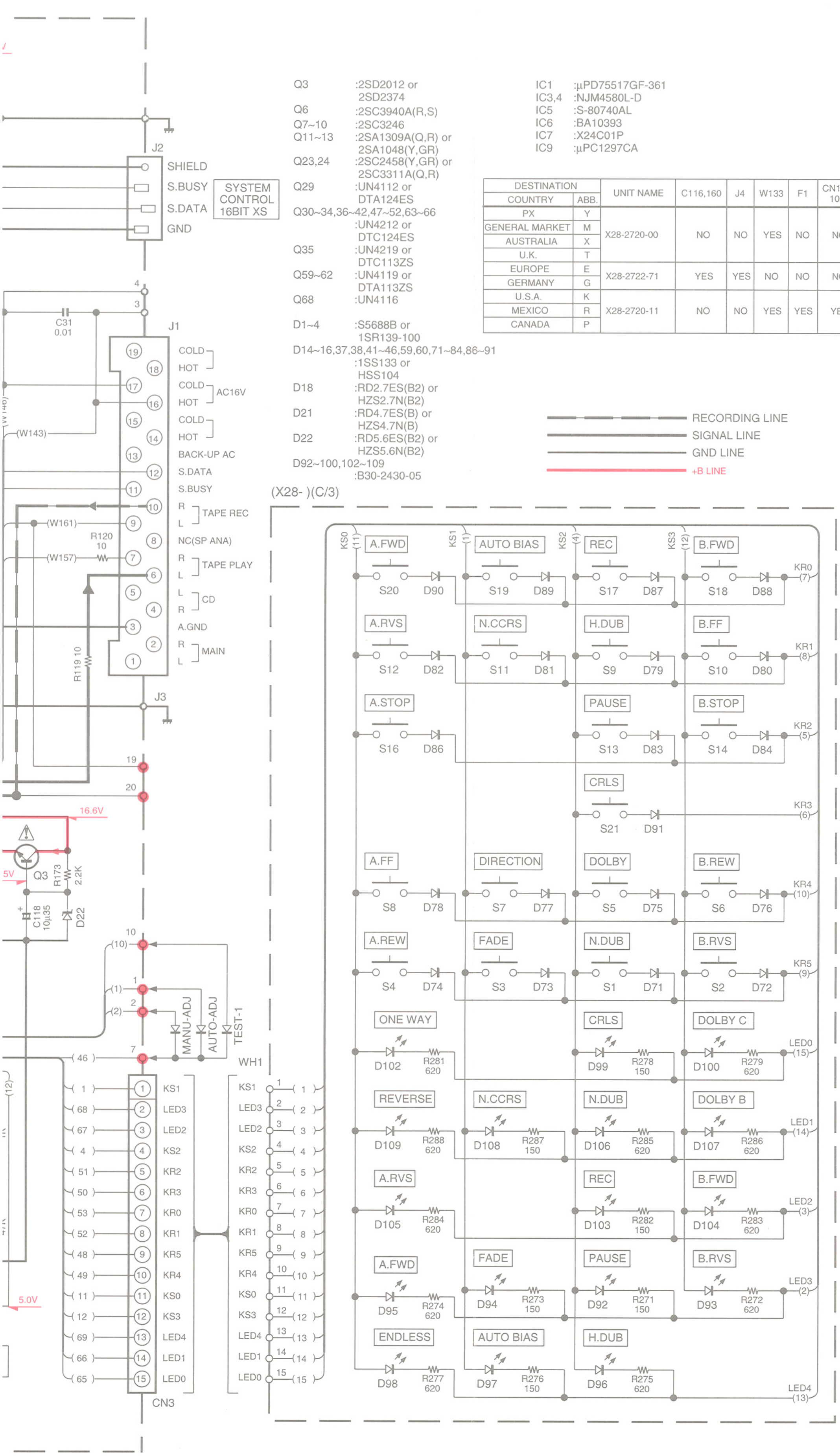
		10	11	12	13	14	15	16	17	18
STOP /PLAY		1.6V	15.6V		0V	0V	0.6V	4.4V	0V	15.6V
REC	NOR				3.2V	1.8V	2.4V		1.8V	
	CrO2				4.6V	2.8V	3.3V		2.8V	


G
H
I
J
K
L
M
N
O
P
(X28-)(B/3)
IC1
µ-COM
CP2 10Kx8
CP3 10Kx8
CP4 10Kx4
CP1 10Kx8
X1 4.19MHz
IC7
E PROM
IC5 RESET
5V AVR
IC6 (1/2)
IC6 (2/2)
PH DETECTOR
VOLTAGE STOP MODE
A.CPM
B.CPM
AO SOL SW
B.SOL SW
A REEL LED CONT(L)
A REEL LED CONT(R)
B REEL LED CONT(L)
B REEL LED CONT(R)
A CAPSTAN SPEED CONT
B CAPSTAN SPEED CONT
A MECHA CONT
B MECHA CONT
BIAS TRAP
EQ H-SP
CN5
CN6
CN101
CN102
F1 250V 1A
W17
DOLBY C. ON:3.8V OFF:5.0V
DOLBY B. ON:3.8V OFF:5.0V
B.FWD ON:3.8V OFF:5.0V
B.RVS ON:2.6V OFF:3.8V
H.DOBB ON:2.6V OFF:3.8V
NOR:3.6V CrO2:0V
CrO2:3.6V NOR:0V
NOR:5.0V OTHERS:0V
MET:0V OTHERS:5.0V
AUTO BIAS:2.9V PLAY
NOR-SP:0V HI-SP:2.9V
17.5V
16.6V
HI SPEED:11.6V NOR SPEED:0V
NOR SPEED:5.0V HI SPEED:0V
(REC-B) (A PLAY) LED(AL)GND (A CROM) MOTOR(-) COM +12V MOTOR(-B) MOTOR(-A) LED(AR) (A PH) SOL(-) (REC-A) (A PACK) METAL
(REC-A) (B PLAY) LED(BL)GND (B CROM) MOTOR(-) COM +12V MOTOR(-B) MOTOR(-A) LED(BR) (B PH) SOL(-) (REC-B) (B PACK) (MET)
C
D

IC9

		1	2	3	4	5	6	7	8	9
STOP /PLAY		4.4V	0V	4.4V	0.6V	0V	0V	15.6V	15.6V	0V
REC	NOR		2.1V		2.6V	2.1V	3.4V			
	CrO2		3.2V		3.6V	3.2V	5.1V			

		10	11	12	13	14	15	16	17	18
STOP /PLAY		1.6V	15.6V		0V	0V	0.6V	4.4V	0V	15.6V
REC	NOR				3.2V	1.8V	2.4V		1.8V	
	CrO2				4.6V	2.8V	3.3V		2.8V	


J2
SHIELD
S.BUSY
S.DATA
GND
SYSTEM CONTROL 16BIT XS
C31 0.01
J1
COLD
HOT
AC16V
BACK-UP AC
S.DATA
S.BUSY
TAPE REC
NC(SP ANA)
TAPE PLAY
CD
A.GND
MAIN
(W143)
(W161)
(W157)
R120 10
R119 10
J3
16.6V
5V
Q3
R173 2.2K
C18 10µ35
D22
MANU-ADJ
AUTO-ADJ
TEST-1
WH1
CN3
KS1
LED3
LED2
KS2
KR2
KR3
KR0
KR1
KR5
KR4
KS0
KS3
LED4
LED1
LED0
5.0V
(X28-)(C/3)
A.FWD S20 D90
AUTO BIAS S19 D89
REC S17 D87
B.FWD S18 D88
A.RVS S12 D82
N.CCRS S11 D81
H.DUB S9 D79
B.FF S10 D80
A.STOP S16 D86
PAUSE S13 D83
B.STOP S14 D84
CRLS S21 D91
A.FF S8 D78
DIRECTION S7 D77
DOLBY S5 D75
B.REW S6 D76
A.REW S4 D74
FADE S3 D73
N.DUB S1 D71
B.RVS S2 D72
ONE WAY D102 R281 620
CRLS D99 R278 150
DOLBY C D100 R279 620
REVERSE D109 R288 620
N.CCRS D108 R287 150
N.DUB D106 R285 620
DOLBY B D107 R286 620
A.RVS D105 R284 620
REC D103 R282 150
B.FWD D104 R283 620
A.FWD D95 R274 620
FADE D94 R273 150
PAUSE D92 R271 150
B.RVS D93 R272 620
ENDLESS D98 R277 620
AUTO BIAS D97 R276 150
H.DUB D96 R275 620
KR0 (7)
KR1 (8)
KR2 (5)
KR3 (6)
KR4 (10)
KR5 (9)
LED0 (15)
LED1 (14)
LED2 (3)
LED3 (2)
LED4 (13)
KS0 (11)
KS1 (1)
KS2 (4)
KS3 (12)

Q3 :2SD2012 or
2SD2374
Q6 :2SC3940A(R,S)
Q7~10 :2SC3246
Q11~13 :2SA1309A(Q,R) or
2SA1048(Y,GR)
Q23,24 :2SC2458(Y,GR) or
2SC3311A(Q,R)
Q29 :UN4112 or
DTA124ES
Q30~34,36~42,47~52,63~66
:UN4212 or
DTC124ES
Q35 :UN4219 or
DTC113ZS
Q59~62 :UN4119 or
DTA113ZS
Q68 :UN4116
D1~4 :S5688B or
1SR139-100
D14~16,37,38,41~46,59,60,71~84,86~91
:1SS133 or
HSS104
D18 :RD2.7ES(B2) or
HZS2.7N(B2)
D21 :RD4.7ES(B) or
HZS4.7N(B)
D22 :RD5.6ES(B2) or
HZS5.6N(B2)
D92~100,102~109
:B30-2430-05

IC1 :µPD75517GF-361
IC3,4 :NJM4580L-D
IC5 :S-80740AL
IC6 :BA10393
IC7 :X24C01P
IC9 :µPC1297CA

DESTINATION		UNIT NAME	C116,160	J4	W133	F1	CN101, 102	W17
COUNTRY	ABB.							
PX	Y	X28-2720-00	NO	NO	YES	NO	NO	YES
GENERAL MARKET	M							
AUSTRALIA	X							
U.K.	T							
EUROPE	E	X28-2722-71	YES	YES	NO	NO	NO	YES
GERMANY	G							
U.S.A.	K	X28-2720-11	NO	NO	YES	YES	YES	NO
MEXICO	R							
CANADA	P							

▬ ▬ ▬ ▬ RECORDING LINE
▬▬▬▬ SIGNAL LINE
——— GND LINE
🟥 +B LINE

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

DOLBY and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation. Noise reduction circuit made under license from Dolby Laboratories Licensing Corporation.

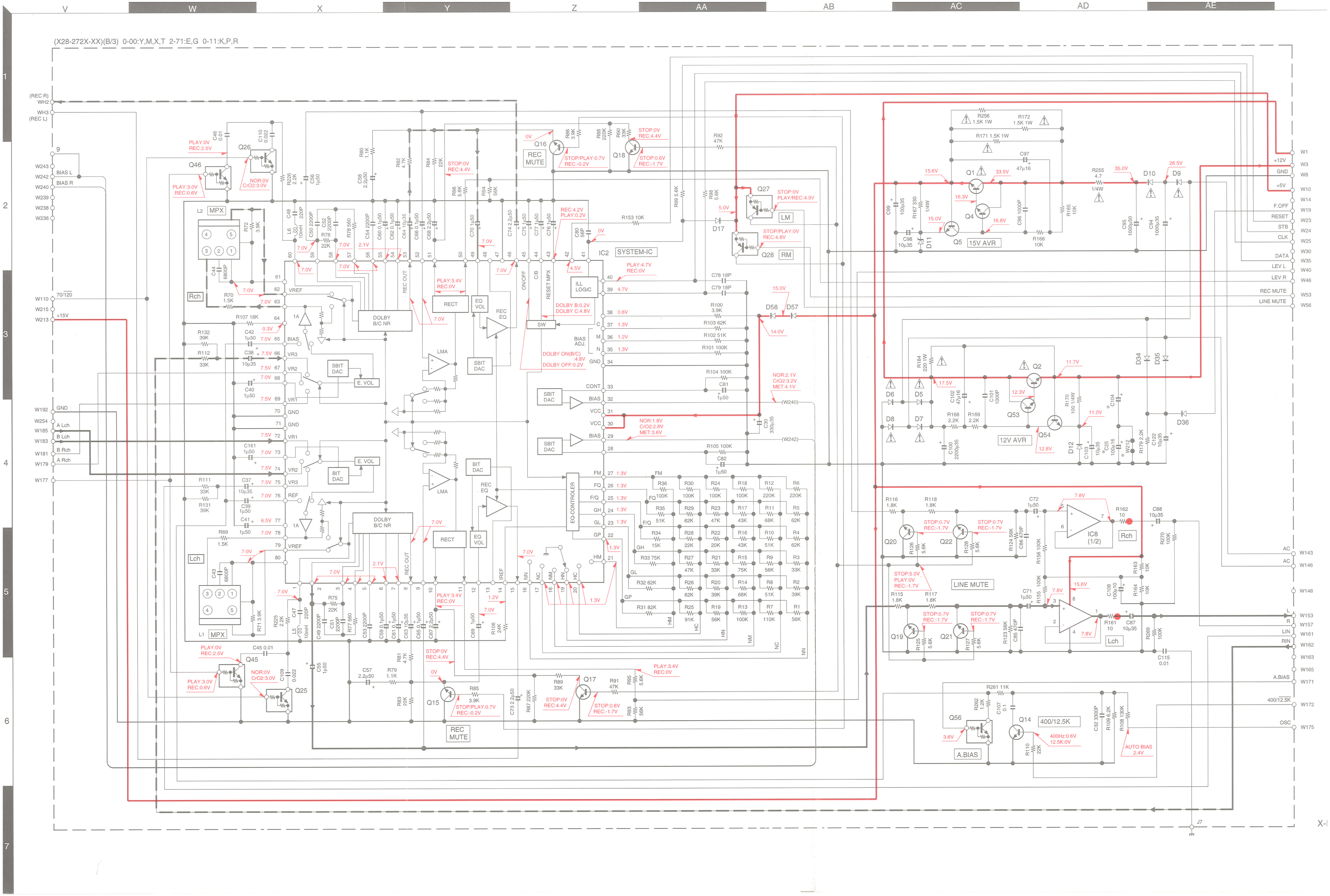
- DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

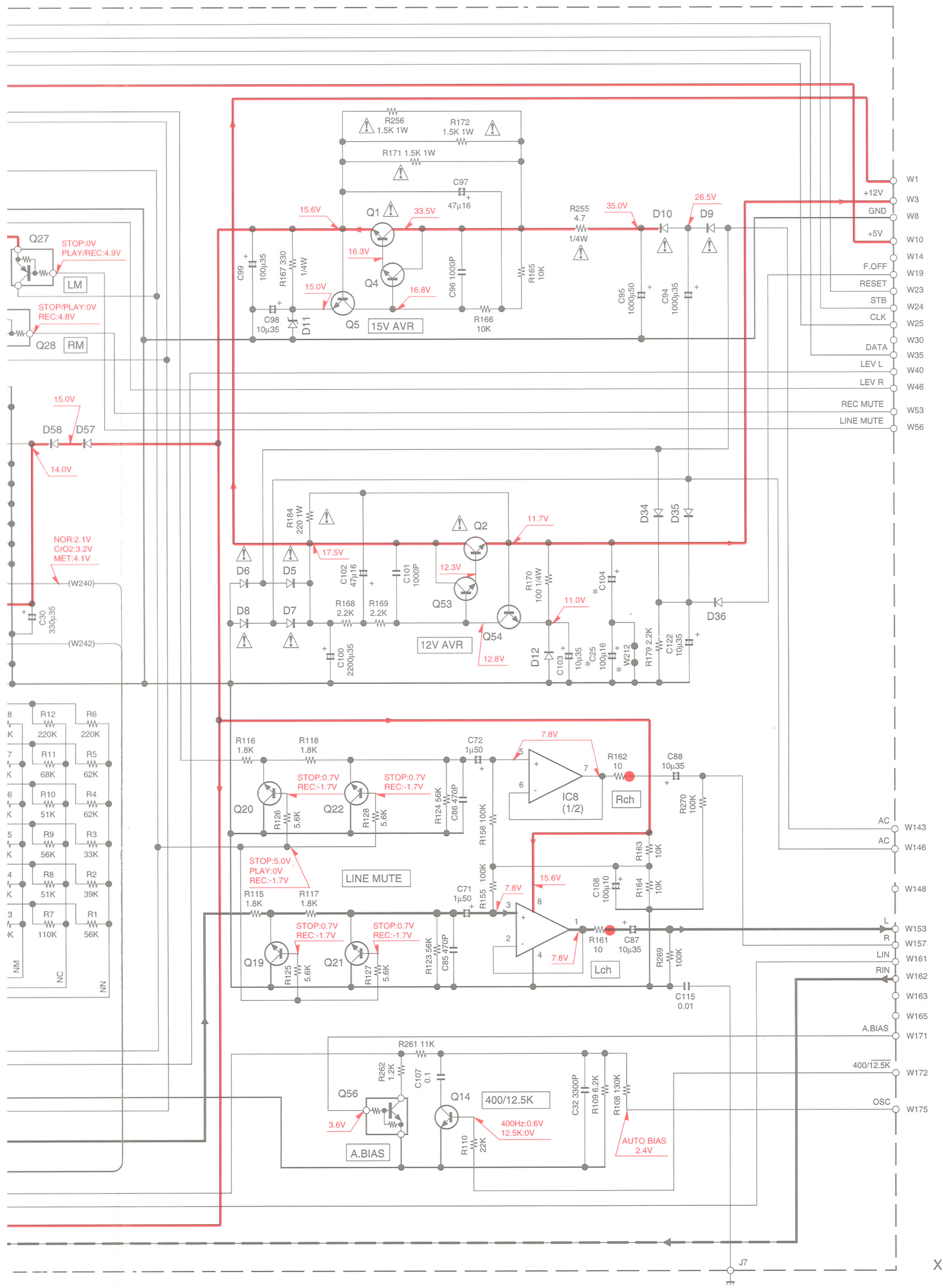
X-F7(K)(1/2)

X-F7

KENWOOD

(X28-272X-XX)(B/3) 0-00:Y,M,X,T 2-71:E,G 0-11:K,P,R


V
W
X
Y
Z
AA
AB
AC
AD
AE
1
2
3
4
5
6
7
(REC R) WH2
WH3 (REC L)
W243
W242 BIAS L
W240 BIAS R
W239
W238
W236
W110 70/120
W215
W213 +15V
W192 GND
W254 A Lch
W185 B Lch
W183
W181 B Rch
W179 A Rch
W177
Q46
Q26
Q45
Q25
Q15
Q16
Q17
Q18
Q27 LM
Q28 RM
D17
IC2 SYSTEM-IC
DOLBY B/C NR
RECT
EQ VOL
REC EQ
LMA
SBIT DAC
BIT DAC
E. VOL
SW
ILL LOGIC
EQ-CONTROLER
VREF
BIAS
VR1
VR2
VR3
REF
GND
VCC
CONT
REC MUTE
MPX
Rch
Lch
L1
L2
D58
D57
Q1
Q4
Q5
15V AVR
D10
D9
D11
Q2
Q53
Q54
12V AVR
D5
D6
D7
D8
D12
D34
D35
D36
Q20
Q22
Q19
Q21
IC8 (1/2)
LINE MUTE
Q56
A.BIAS
Q14
400/12.5K
AUTO BIAS 2.4V
W1
W3 +12V
W8 GND
W10 +5V
W14
W19 F.OFF
W23 RESET
W24 STB
W25 CLK
W30 DATA
W35 LEV L
W40 LEV R
W46
W53 REC MUTE
W56 LINE MUTE
W143 AC
W146 AC
W148
W153 L
W157 R
W161 LIN
W162 RIN
W163
W165
W171 A.BIAS
W172 400/12.5K
W175 OSC
J7
X-I
PLAY:0V REC:2.5V
PLAY:3.0V REC:0.6V
NOR:0V CrO2:3.0V
STOP:0V REC:4.4V
STOP/PLAY:0.7V REC:-0.2V
STOP:0.6V REC:-1.7V
STOP:0V PLAY/REC:4.9V
STOP/PLAY:0V REC:4.8V
PLAY:4.7V REC:0V
PLAY:3.4V REC:0V
DOLBY B:0.2V DOLBY C:4.8V
DOLBY ON(B/C):4.8V DOLBY OFF:0.2V
NOR:1.8V CrO2:2.8V MET:3.6V
NOR:2.1V CrO2:3.2V MET:4.1V
STOP:5.0V PLAY:0V REC:-1.7V
STOP:0.7V REC:-1.7V
400Hz:0.6V 12.5K:0V

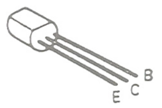

R256
1.5K 1W
R172
1.5K 1W
R171 1.5K 1W
C97
47µ16
15.6V
33.5V
Q1
16.3V
Q4
16.8V
15.0V
Q5
15V AVR
C99
100µ35
R167 330
1/4W
C98
10µ35
D11
C96 1000P
R166
10K
R165
10K
R255
4.7
1/4W
35.0V
D10
26.5V
D9
C95
1000µ50
C94
1000µ35
Q27
STOP:0V
PLAY/REC:4.9V
LM
STOP/PLAY:0V
REC:4.8V
Q28
RM
15.0V
D58
D57
14.0V
NOR:2.1V
CrO2:3.2V
MET:4.1V
(W240)
(W242)
C30
330µ35
R184
220 1W
Q2
11.7V
17.5V
D6
D5
D8
D7
C102
47µ16
C101
1000P
12.3V
Q53
R168
2.2K
R169
2.2K
12V AVR
Q54
12.8V
C100
2200µ35
R170
100 1/4W
11.0V
*C104
D12
C103
10µ35
*C25
100µ16
*W212
R179 2.2K
C122
10µ35
D34
D35
D36
R12
220K
R6
220K
R11
68K
R5
62K
R10
51K
R4
62K
R9
56K
R3
33K
R8
51K
R2
39K
R7
110K
R1
56K
NM
NC
NN
R116
1.8K
R118
1.8K
C72
1µ50
Q20
STOP:0.7V
REC:-1.7V
R126
5.6K
Q22
R128
5.6K
R124 56K
C86 470P
R156 100K
7.8V
IC8
(1/2)
R162
10
Rch
C88
10µ35
R270
100K
STOP:5.0V
PLAY:0V
REC:-1.7V
LINE MUTE
R115
1.8K
R117
1.8K
Q19
R125
5.6K
Q21
R127
5.6K
R123 56K
C85 470P
C71
1µ50
R155 100K
15.6V
R163
10K
C108
100µ10
R164
10K
R161
10
C87
10µ35
Lch
R269
100K
C115
0.01
R261 11K
R262
1.2K
C107
0.1
Q56
3.6V
A.BIAS
Q14
400/12.5K
400Hz:0.6V
12.5K:0V
R110
22K
C32 3300P
R109 6.2K
R108 130K
AUTO BIAS
2.4V
+12V
GND
+5V
F.OFF
RESET
STB
CLK
DATA
LEV L
LEV R
REC MUTE
LINE MUTE
AC
AC
L
R
LIN
RIN
A.BIAS
400/12.5K
OSC
W1
W3
W8
W10
W14
W19
W23
W24
W25
W30
W35
W40
W46
W53
W56
W143
W146
W148
W153
W157
W161
W162
W163
W165
W171
W172
W175
J7

X-F7(K)(2/2)

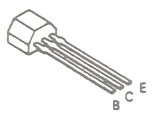
Q1,2	:2SD2012 or 2SD2374
Q4,5	2SC3940A(R,S)
Q14,17,18,53,54	:2SC3311A(Q,R) or 2SC2458(Y,GR)
Q15,16,19~22	:2SD1302(S,T)
Q25,26,45,46,56	:UN4212 or DTC124ES
Q27,28	:UN4112 or DTA124ES
D5~10	:S5688B or 1SR139-100
D11	:RD15ES(B) or HZS15N(B)
D12	:RD11ES(B2) or HZS11N(B2)
D17,34~36,57,58	:1SS133 or HSS104
IC2	:HA12167FB
IC8	:NJM4565D

DESTINATION		UNIT NAME	C104	C25	W212
COUNTRY	ABB.				
PX GENERAL MARKET AUSTRALIA U.K.	Y M X T	X28-2720-00	100µ16	YES	NO
EUROPE GERMANY	E G	X28-2722-71	100µ16	YES	NO
U.S.A. CANADA MEXICO	K P R	X28-2720-11	47µ16	NO	YES

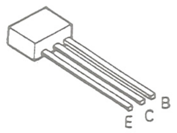
2SC3246
2SC3940A
2SD1302



DTA124ES
DTC124ES
UN4112
2SA1048
2SC2458

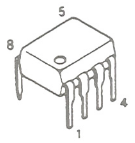


UN4212
UN4219
2SA1309A
2SC3311A

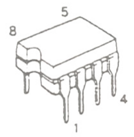


2SD2012
2SD2374

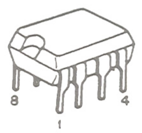
X24C01P



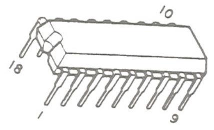
NJM4565D



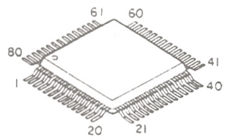
BA10393
NJM4580L-D



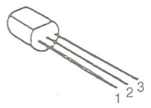
UPC1297CA



HA12167FB


61
60
80
41
1
40
20
21

S-80740AL



━━ SIGNAL LINE
╍╍ RECORDING LINE
── GND LINE
━━ +B LINE

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

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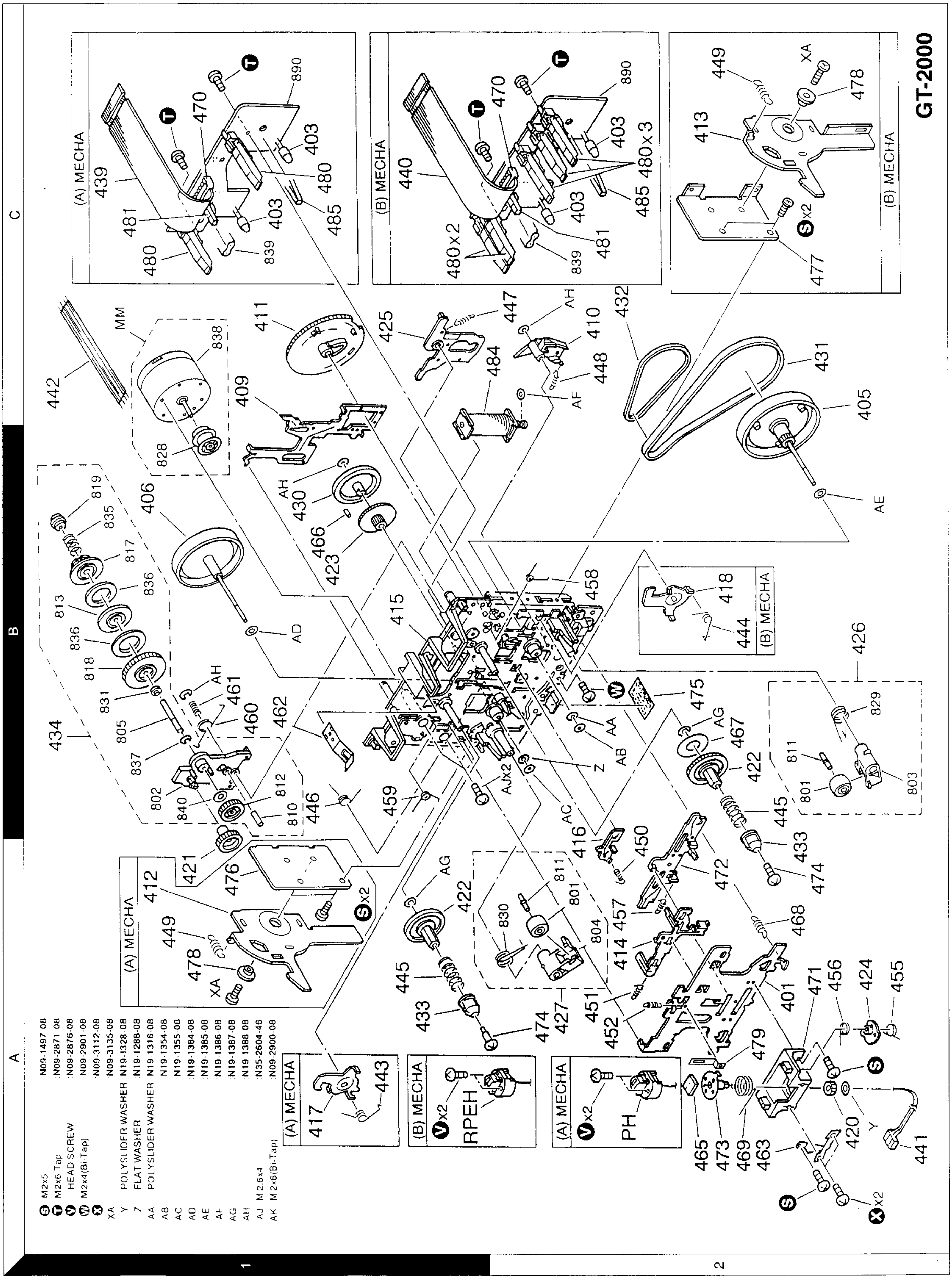
- DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

X-F7
KENWOOD

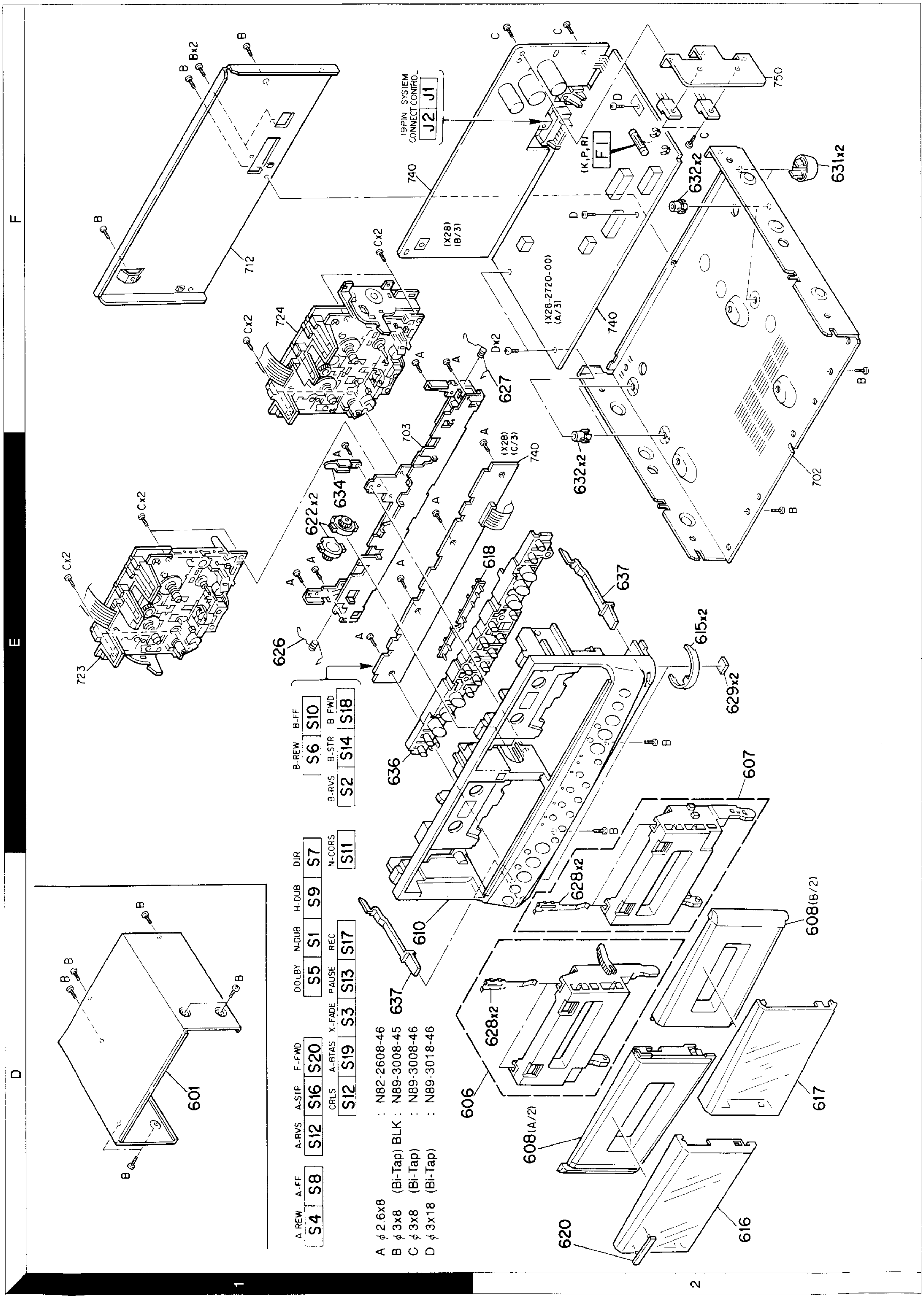
EXPLODED VIEW (MECHANISM)


GT-2000
(A) MECHA
439
481
480
470
890
403
485
839
(B) MECHA
440
480×2
480×3
413
449
478
XA
477
S×2
442
MM
838
828
411
409
425
447
AH
410
484
448
AF
432
431
405
AE
406
AD
819
835
817
836
813
818
831
805
837
802
840
812
810
434
430
466
423
415
458
418
444
426
829
811
801
803
461
460
462
446
459
475
AG
467
422
445
433
474
AA
AB
Z
AC
AJ×2
416
450
472
421
476
412
830
804
457
414
451
452
427
468
401
471
456
424
455
479
465
473
469
463
420
Y
441
X×2
417
443
RPEH
PH
V×2
A
B
C
1
2

Ⓢ	M2x5	N09-1497-08
Ⓣ	M2x6 Tap	N09-2871-08
Ⓥ	HEAD SCREW	N09-2876-08
Ⓦ	M2x4(Bi-Tap)	N09-2901-08
Ⓧ		N09-3112-08
XA		N09-3135-08
Y	POLYSLIDER WASHER	N19-1328-08
Z	FLAT WASHER	N19-1288-08
AA	POLYSLIDER WASHER	N19-1316-08
AB		N19-1354-08
AC		N19-1355-08
AD		N19-1384-08
AE		N19-1385-08
AF		N19-1386-08
AG		N19-1387-08
AH		N19-1388-08
AJ	M2.6x4	N35-2604-46
AK	M2x6(Bi-Tap)	N09-2900-08

Parts with the exploded numbers larger than 700 are not supplied.

EXPLODED VIEW (UNIT)


601
606
607
608(A/2)
608(B/2)
610
615x2
616
617
618
620
622x2
626
627
628x2
628x2
629x2
631x2
632x2
632x2
634
636
637
637
702
703
712
723
724
740
740
740
750
19PIN SYSTEM CONNECT CONTROL
J2 J1
(K,P,R) F1
(X28) (B/3)
(X28-2720-00) (A/3)
(X28) (C/3)
A-REW S4
A-FF S8
A-RVS S12
A-STP S16
F-FWD S20
DOLBY S5
N-DUB S1
H-DUB S9
DIR S7
CRLS S12
A-BTAS S19
X-FADE S3
PAUSE S13
REC S17
N-CORS S11
B-REW S6
B-FF S10
B-RVS S2
B-STR S14
B-FWD S18
Bx2
Cx2
Dx2
D
E
F
1
2

A ϕ2.6x8 : N82-2608-46
B ϕ3x8 (Bi-Tap) BLK : N89-3008-45
C ϕ3x8 (Bi-Tap) : N89-3008-46
D ϕ3x18 (Bi-Tap) : N89-3018-46

Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

⁎ New Parts
Parts without **Parts No.** are not supplied.
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Teile ohne **Parts No.** werden nicht geliefert.

❶

Ref. No.	Address	New Parts	Parts No.	Description	Destination	Remarks
				X-F7		
601	1D	⁎	A01-3215-01	METALLIC CABINET		
606	2D	⁎	A53-1855-03	CASSETTE HOLDER ASSY		A
607	2E	⁎	A53-1857-03	CASSETTE HOLDER ASSY		B
608	2D	⁎	A53-1859-11	CASSETTE LID		
610	1D	⁎	A60-0703-01	PANEL		
615	2E		B07-2268-14	ESCUTCHEON (FRONT FOOT)		
616	2D	⁎	B10-2083-02	FRONT GLASS		A
617	2D	⁎	B10-2084-02	FRONT GLASS		B
618	2E	⁎	B19-1537-04	LIGHTING BOARD		
620	2D		B43-0301-04	KENWOOD BADGE		
-			B46-0310-03	WARRANTY CARD	TEG	
622	1E		D39-0314-05	DAMPER		
626	1E		G01-3760-04	TORSION COIL SPRING		A
627	2F		G01-3761-04	TORSION COIL SPRING		B
628	2D		G02-1001-24	FLAT SPRING		
629	2E		G11-2231-14	CUSHION (FRONT FOOT)		
-			H10-5977-02	POLYSTYRENE FOAMED FIXTURE		S
-			H10-5978-02	POLYSTYRENE FOAMED FIXTURE		S
-			H10-5979-02	POLYSTYRENE FOAMED FIXTURE		W
-			H10-5980-02	POLYSTYRENE FOAMED FIXTURE		W
-			H20-0581-04	PROTECTION COVER M		
-			H25-0681-04	PROTECTION BAG		
-			H50-1430-04	ITEM CARTON CASE	KRPYX	S
-		⁎	H50-1432-04	ITEM CARTON CASE	M	S
-			H50-1433-04	ITEM CARTON CASE	KRYX	W
-			H50-1434-04	ITEM CARTON CASE	TEG	W
-		⁎	H50-1435-04	ITEM CARTON CASE	M	W
631	2F		J02-0366-15	FOOT (REAR)		
632	2E,2F		J19-3751-04	UNIT HOLDER		
634	1E		J21-6125-04	MOUNTING HARDWARE		
636	1E	⁎	K29-6085-02	KNOB (OPERETION,FUNCTION)		
637	1D,2E	⁎	K29-6087-04	KNOB (EJECT)		
RECORD/PLAY UNIT(X28-2720-00:YMXT, 6-11:KRP, 2-71:EG)						
D92 -100			B30-2430-05	LED		
D102-109			B30-2430-05	LED		
C1,2			CC45FSL1H221J	CERAMIC 220PF J		
C3,4			CK45FB1H561K	CERAMIC 560PF K		
C5,6			CK45FB1H681K	CERAMIC 680PF K		
C7-10			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C11 -14			CK45FB1H391K	CERAMIC 390PF K		
C15 -18			CQ93FMG1H223J	MYLAR 0.022UF J		
C19 -22			CE04LW1V100M	ELECTRO 10UF 35WV		
C23 ,24			CQ93FMG1H333J	MYLAR 0.033UF J		
C25			CE04LW1C101M	ELECTRO 100UF 16WV	YMXTEG	
C27 ,28			CC45FSL1H221J	CERAMIC 220PF J		
C29			CE04LW1C101M	ELECTRO 100UF 16WV		
C30			CE04LW1V331M	ELECTRO 330UF 35WV		
C31			CK45FF1H103Z	CERAMIC 0.010UF Z		
C32			CQ93FMG1H332J	MYLAR 3300PF J		

L:Scandinavia **K:**USA **P:**Canada **R:**Mexico **A:**A DECK
Y:PX(Far East, Hawaii) **T:**England **E:**Europe **G:**Germany **B:**B DECK
Y:AAFES(Europe) **X:**Australia **M:**Other Areas **S:**Singapore Made **W:**Malaysia Made

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❷

Ref. No.	Address	New Parts	Parts No.	Description	Destination	Remarks
C33 -36			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C37 ,38			CE04LW1V100M	ELECTRO 10UF 35WV		
C39 -42			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C43 ,44			CK45FB1H682K	CERAMIC 6800PF K		
C45 ,46			CK45FF1H103Z	CERAMIC 0.010UF Z		
C47 ,48			CC45FSL1H221J	CERAMIC 220PF J		
C49 -54			CQ93FMG1H222J	MYLAR 2200PF J		
C55 ,56			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C57 ,58			CE04LW1H2R2M	ELECTRO 2.2UF 50WV		
C59 -62			CE04LW1H0R1M	ELECTRO 0.1UF 50WV		
C63 ,64			CE04LW1V100M	ELECTRO 10UF 35WV		
C65 ,66			CE04LW1H0R1M	ELECTRO 0.1UF 50WV		
C67 ,68			CE04LW1H2R2M	ELECTRO 2.2UF 50WV		
C69 -72			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C73 ,74			CE04LW1H2R2M	ELECTRO 2.2UF 50WV		
C75 -77			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C78 ,79			CC45FSL1H180J	CERAMIC 18PF J		
C80			CC45FSL1H560J	CERAMIC 56PF J		
C81 ,82			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C85 ,86			CK45FB1H471K	CERAMIC 470PF K		
C87 ,88			CE04LW1V100M	ELECTRO 10UF 35WV		
C89			CK45FF1H223Z	CERAMIC 0.022UF Z		
C90 ,91			CK45FF1H103Z	CERAMIC 0.010UF Z		
C92 ,93			CC45FSL1H221J	CERAMIC 220PF J		
C94			CE04LW1V102M	ELECTRO 1000UF 35WV		
C95			CE04LW1H102M	ELECTRO 1000UF 50WV		
C96			CK45FB1H102K	CERAMIC 1000PF K		
C97			CE04LW1C470M	ELECTRO 47UF 16WV		
C98			CE04LW1V100M	ELECTRO 10UF 35WV		
C99			CE04LW1V101M	ELECTRO 100UF 35WV		
C100			CE04LW1V222M	ELECTRO 2200UF 35WV		
C101			CK45FB1H102K	CERAMIC 1000PF K		
C102			CE04LW1C470M	ELECTRO 47UF 16WV		
C103			CE04LW1V100M	ELECTRO 10UF 35WV		
C104			CE04LW1C101M	ELECTRO 100UF 16WV	YMXTEG	
C104			CE04LW1C470M	ELECTRO 47UF 16WV	KRP	
C105			CK45FF1H103Z	CERAMIC 0.010UF Z		
C106			CE04LW1A101M	ELECTRO 100UF 10WV		
C107			CQ93FMG1H104J	MYLAR 0.10UF J		
C108			CE04LW1A101M	ELECTRO 100UF 10WV		
C109,110			CK45FF1H223Z	CERAMIC 0.022UF Z		
C111			CE04LW1C220M	ELECTRO 22UF 16WV		
C112			CE04LW1C470M	ELECTRO 47UF 16WV		
C113			CE04LW0J221M	ELECTRO 220UF 6.3WV		
C115			CK45FF1H103Z	CERAMIC 0.010UF Z	KRPYMX	
C115			CK45FF1H103Z	CERAMIC 0.010UF Z	T	
C115,116			CK45FF1H103Z	CERAMIC 0.010UF Z	EG	
C118			CE04LW1V100M	ELECTRO 10UF 35WV		
C122			CE04LW1V100M	ELECTRO 10UF 35WV		
C127,128			CE04LW1HR22M	ELECTRO 0.22UF 50WV		
C129			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C133			CE04LW1V100M	ELECTRO 10UF 35WV		
C134			CE04LW1HR47M	ELECTRO 0.47UF 50WV		
C135			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C136			CE04LW1V100M	ELECTRO 10UF 35WV		

L:Scandinavia **K:**USA **P:**Canada **R:**Mexico **S:**Singapore Made
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❸

Ref. No.	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
C137,138			CQ93FMG1H562J	MYLAR 5600PF J		
C139			CK45FF1H103Z	CERAMIC 0.010UF Z		
C140			CQ93HP2A103J	MYLAR 0.010UF J		
C141-144			CQ93FMG1H223J	MYLAR 0.022UF J		
C145,146			CQ93FMG1H103J	MYLAR 0.010UF J		
C147,148			CC45FSL1H561J	CERAMIC 560PF J		
C149			CE04LW1V100M	ELECTRO 10UF 35WV		
C150			CC45FSL2H100D	CERAMIC 10PF D		
C155,156			C91-1434-05	FILM 150PF J		
C157,158			C91-1436-05	FILM 220PF J		
C160			CK45FF1H103Z	CERAMIC 0.010UF Z	EG	
C161			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C162			CE04LW1C101M	ELECTRO 100UF 16WV		
C163,164			CE04LW0J331M	ELECTRO 330UF 6.3WV		
C165-168			CQ93FMG1H332J	MYLAR 3300PF J		
CN1			E40-3247-05	PIN ASSY		
CN2			E40-3249-05	PIN ASSY		
CN3			E40-4609-05	PIN ASSY		
CN5 ,6			E40-4609-05	PIN ASSY		
J1			E58-0006-05	RECTANGULAR RECEPTACLE		
J2			E08-0311-05	RECTANGULAR RECEPTACLE		
⚠ F1			F04-1026-05	FUSE (UL) (250V 1A)	KRP	
CN101,102				J13-0075-05 FUSE CLIP	KRP	
J5,6			J11-0098-05	WIRE CLAMPER		
L1,2			L79-1210-05	LC FILTER		
L3,4			L32-0562-05	BIAS OSCILATING COIL		
L5-8			L40-1035-20	SMALL FIXED INDUCTOR(10MH,J)		
L9			L32-0570-05	BIAS OSCILATING COIL		
X1			L78-0267-05	RESONATOR (4.194MHZ)		
CP1 -3			R90-0805-05	MULTI-COMP 10KX8 J 1/4W		
CP4			R90-0809-05	MULTI-COMP 10KX4 J 1/6W		
R167			RD14NB2E331J	RD 330 J 1/4W		
R170			RD14NB2E101J	RD 100 J 1/4W		
⚠ R171,172			RS14KB3A152J	FL-PROOF RS 1.5K J 1W		
⚠ R184			RS14KB3A221J	FL-PROOF RS 220 J 1W		
⚠ R203			RD14NB2E220J	RD 22 J 1/4W		
R216			RD14NB2E5R6J	RD 5.6 J 1/4W		
⚠ R255			RD14NB2E4R7J	RD 4.7 J 1/4W		
⚠ R256			RS14KB3A152J	FL-PROOF RS 1.5K J 1W		
VR1 ,2			R12-3685-05	TRIMMING POT.(10K)		
VR3 ,4			R12-3686-05	TRIMMING POT.(22K)		
K1			S51-2089-05	MAGNETIC RELAY		
K1			S76-0018-05	MAGNETIC RELAY		
S1-14			S40-1064-05	PUSH SWITCH		
S16 -21			S40-1064-05	PUSH SWITCH		
⚠ D1-10			S5688B	DIODE		
⚠ D1-10			1SR139-100	DIODE		
D11			HZS15N(B)	ZENER DIODE		
D11			RD15ES(B)	ZENER DIODE		
D12			HZS11N(B2)	ZENER DIODE		
D12			RD11ES(B2)	ZENER DIODE		
D14 -17			HSS104	DIODE		

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D14 -17			1SS133	DIODE		
D18			HZS2.7N(B2)	ZENER DIODE		
D18			RD2.7ES(B2)	ZENER DIODE		
D21			HZS4.7N(B)	ZENER DIODE		
D21			RD4.7ES(B)	ZENER DIODE		
D22			HZS5.6N(B2)	ZENER DIODE		
D22			RD5.6ES(B2)	ZENER DIODE		
D34 -38			HSS104	DIODE		
D34 -38			1SS133	DIODE		
D41 -46			HSS104	DIODE		
D41 -46			1SS133	DIODE		
D57 -60			HSS104	DIODE		
D57 -60			1SS133	DIODE		
D71 -84			HSS104	DIODE		
D71 -84			1SS133	DIODE		
D86 -91			HSS104	DIODE		
D86 -91			1SS133	DIODE		
IC1		*	UPD75517GF-361	MI-COM IC		
IC2			HA12167FB	IC(DOLBY B/C, REC EQ)		
IC3 ,4			NJM4580L-D	IC(OP AMP X2)		
IC5			S-80740AL	IC(VOLTAGE DETECTOR)		
IC6			BA10393	IC(DUAL COMPALATOR)		
IC7			X24C01P	IC(128X8BIT SERIAL EEPROM)		
IC8			NJM4565D	IC(OP AMP X2)		
IC9			UPC1297CA	IC(DOL HX PRO SYSTEM)		
⚠ Q1-3			2SD2012	TRANSISTOR		
⚠ Q1-3			2SD2374	TRANSISTOR		
Q4-6			2SC3940A(R,S)	TRANSISTOR		
Q7-10			2SC3246	TRANSISTOR		
Q11 -13			2SA1048(Y,GR)	TRANSISTOR		
Q11 -13			2SA1309A(Q,R)	TRANSISTOR		
Q14			2SC2458(Y,GR)	TRANSISTOR		
Q14			2SC3311A(Q,R)	TRANSISTOR		
Q15 ,16			2SD1302(S,T)	TRANSISTOR		
Q17 ,18			2SC2458(Y,GR)	TRANSISTOR		
Q17 ,18			2SC3311A(Q,R)	TRANSISTOR		
Q19 -22			2SD1302(S,T)	TRANSISTOR		
Q23 ,24			2SC2458(Y,GR)	TRANSISTOR		
Q23 ,24			2SC3311A(Q,R)	TRANSISTOR		
Q25 ,26			DTC124ES	DIGITAL TRANSISTOR		
Q25 ,26			UN4212	TRANSISTOR		
Q27 -29			DTA124ES	DIGITAL TRANSISTOR		
Q27 -29			UN4112	TRANSISTOR		
Q30 -34			DTC124ES	DIGITAL TRANSISTOR		
Q30 -34			UN4212	TRANSISTOR		
Q35			DTC113ZS	DIGITAL TRANSISTOR		
Q35			UN4219	TRANSISTOR		
Q36 -42			DTC124ES	DIGITAL TRANSISTOR		
Q36 -42			UN4212	TRANSISTOR		
Q45 -52			DTC124ES	DIGITAL TRANSISTOR		
Q45 -52			UN4212	TRANSISTOR		
Q53 ,54			2SC2458(Y,GR)	TRANSISTOR		
Q53 ,54			2SC3311A(Q,R)	TRANSISTOR		
Q56			DTC124ES	DIGITAL TRANSISTOR		
Q56			UN4212	TRANSISTOR		

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Ref. No.	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
Q59 -62			DTA113ZS	DIGITAL TRANSISTOR		
Q59 -62			UN4119	TRANSISTOR		
Q63 -66			DTC124ES	DIGITAL TRANSISTOR		
Q63 -66			UN4212	TRANSISTOR		
A CASSETTE MECHANISM (D40-1400- *5) **B CASSETTE MECHANISM (D40-1401- *5)**						
401	2A		A10-3178-08	HEAD CHASSIS		
403	1C,2C		B30-2409-08	LED SEL2415E		
405	2C		D01-0175-08	FLYWHEEL (R) ASSY		
406	1B		D01-0176-08	FLYWHEEL (L) ASSY		
409	1C	*	D10-3479-08	SHIFT LEVER		
410	2C	*	D10-3471-18	HEAD CHANGE ARM		
411	1C	*	D13-1622-18	CAM GEAR		
412	1A		D1-08	EJECT LEVER (L) (A MECHA)		
413	2C		D10-3501-08	EJECT LEVER (R) (B MECHA)		
414	2A		D10-3478-08	SELECT LEVER		
415	1B		D10-3479-08	CHASSIS OS ASSY		
416	2A		D10-3480-08	C/R LEVER		
417	1A		D10-3502-08	ARM (LEFT) (INTER LOCK)		
418	2B		D10-3503-08	ARM (RIGHT) (INTER LOCK)		
420	2A		D13-0981-08	ROTATION GEAR		
421	1A		D13-1616-08	REW GEAR		
422	1A,2B		D13-1617-08	REEL GEAR		
423	1B		D13-1618-08	IDLER GEAR		
424	2A		D13-1621-08	RETURN GEAR		
425	1C	*	D10-3470-08	TRIGGER ARM		
426	2B		D14-0367-08	PINCH ARM (R) ASSY		
427	2A		D14-0368-08	PINCH ARM (L) ASSY		
430	1B		D15-0369-08	IDLER PULLEY		
431	2C		D16-0375-08	DRIVE BELT		
432	2C		D16-0376-08	CLUTCH BELT		
433	1A,2A		D19-0270-18	REEL CAP (A)		
434	1B	*	D19-0287-18	CLUTCH ARM ASSY		
441	2A	*	E35-0005-08	3P HEAD WIRE ASSY (A MECHA)		
441	2A		E35-1006-08	5P HEAD WIRE ASSY (B MECHA)		
442	1C		E35-0986-08	MOTOR WIRE		
439,440	1C		E35-0358-08	15P FLAT RIBBON WIRE		
443	1A		G01-3706-08	SPRING (L) (A MECHA)		
444	2B	*	G01-3707-18	SPRING (R) (B MECHA)		
445	1A,2B		G01-3709-08	B.T SPRING		
446	1B		G01-3710-08	SHIFT LEVER SP		
447	1C		G01-3711-08	TRIGGER ARM SP		
448	2C		G01-3712-08	HEAD CHANGE ARM SP		
449	1A,2C		G01-3708-08	EJECT SP		
450	2A		G01-3714-08	C/R LEVER SP		
451	2A		G01-3715-08	SELECT SP		
452	2A		G01-3716-08	SHIFT SP		
455	2A		G01-3718-08	RETURN SPR		
456	2A		G01-3719-08	FWD SPR		
457	2A		G01-3720-08	HEAD RETURN PLATE SP		
458	2B		G01-3721-08	BRAKE SP (R)		
459	1B		G01-3722-08	BRAKE SP (L)		

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460	1B		G01-3724-08	CLUTCH ARM SPRING (B)		
461	1B		G01-3725-08	CLUTCH SP		
462	1B		G02-0913-08	PACK SPRING		
463	2A	*	G02-1068-08	AZIMUTH SPR		
465	2A		G11-2117-08	HEAD WIRE CLAMP		
466	1B		G11-2205-08	TUBE		
467	2B		G16-0791-08	REFLECT SEAL		
468	2A		G01-3739-08	HEAD CHASSIS SP		
469	2A	*	G01-3790-08	EARTH SP		
470	1C		J19-3652-08	CABLE HOLDER		
471	2A	*	J39-0188-08	HEAD BASE		
472	2A		J21-6135-08	HEAD RETURN PLATE		
473	2A		J21-6199-08	HEAD PLATE ASSY		
474	2A		J42-0183-08	REEL BUSH		
475	2B		J69-0086-08	FILAMENT TAPE		
476	1A		J21-6178-08	BRACKET (L) (A MECHA)		
477	2C		J21-6179-08	BRACKET (R) (B MECHA)		
478	1A,2C		J31-0851-08	EJECT COLLAR		
479	2A	*	J90-0832-08	SHIFT SP GUIDE		
AA			N19-1316-08	POLY WASHER		
AB			N19-1354-08	NYLON WASHER		
AC			N19-1355-08	NYLON WASHER		
AD			N19-1384-08	POLY WASHER		
AE			N19-1385-08	POLY WASHER		
AF			N19-1386-08	POLY WASHER		
AG			N19-1387-08	TEFLON WASHER		
AH			N19-1388-08	POLY WASHER		
S			N09-1497-08	TAP TITE SCREW		
T			N09-2871-08	TAPPING SCREW		
V			N09-2876-08	HEAD SCREW		
W			N09-2901-08	BIND TAP TITE SCREW		
X			N09-3112-08	AZIMUTH SCREW		
XA			N09-3135-08	BIND TAP TITE SCREW 2.6 *6		
Y		*	N19-1328-08	POLY WASHER		
Z			N19-1288-08	POLY WASHER		
480	1C,2C		S74-0033-08	REC SWITCH		
481	1C,2C		S74-0042-08	PLAY SWITCH		
484	1C		T94-0233-08	SOLENOID ASSY		
485	1C,2C		T95-0125-08	PHOTO INTERRUPTER		
MM	1C		T42-0687-08	MOTOR ASSY		
PH	2A		T31-0072-08	ROTATION HD(PB)KP-7442-CS-8352 (A MACHA)		
RPEH	1A		T39-0027-08	ROTATION HD(RP)KC-9242-CB-8354 (B MACHA)		

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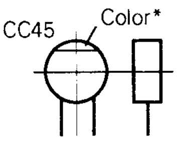
PARTS LIST

CAPACITORS

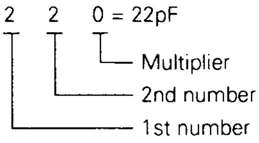
CC 45 TH 1H 220 J
1 2 3 4 5 6

1 = Type ... ceramic, electrolytic, etc.
2 = Shape ... round, square, ect.
3 = Temp. coefficient
4 = Voltage rating
5 = Value
6 = Tolerance



• Capacitor value

010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF



• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/°C

• Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40	+80	+100	More than 10μF - 10 ~ +50
							-20	-20	-0	Less than 4.7μF -10 ~ +75

(Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

2nd word / 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

• Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
(Chip) (B, F)

Refer to the table above.
1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension (Chip capacitors)

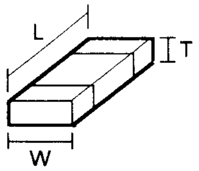
Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0

RESISTORS

• Chip resistor (Carbon)

(EX) R K 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip) (B,F)

Dimension



• Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Rating wattage
6 = Value
7 = Tolerance

Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6±0.2	0.8±0.2	0.5±0.1

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

SPECIFICATIONS

Cassette deck section

Track		4 - track, 2-channel stereo
Recording system		AC bias system (Frequency : 105 kHz)
Heads		
A deck	Playback head	1
B deck	Playback / recording head	1
	Erasing head	1
Motors		
A deck		1
B deck		1
Fast winding time		Approx. 110 seconds (C-60 tape)
Frequency response		
Normal tape		80 Hz to 17,000 Hz, ±3 dB
CrO_2 tape		80 Hz to 18,000 Hz, ±3 dB
Metal tape		80 Hz to 18,000 Hz, ±3 dB

Signal to noise ratio	
Dolby B NR ON	66 dB (Metal tape)
Dolby C NR ON	73 dB (Metal tape)
Dolby NR OFF	58 dB (Metal tape)
Harmonic distortion	Less than 3.2 % (1kHz, 3rd H.D., 250 nWb / m, Metal tape)
Wow and flutter	0.09 % (W.R.M.S)
DIN	0.19 %

[General]

Dimensions	W : 270 mm (10 - 5 / 8") H : 124 mm (4 - 7 / 8") D : 300 mm (11 - 13 / 16")
Weight (net)	2.7 kg (5.6 lb)

Note:
Component and circuity are subject to modification to insure best operation under differing local conditions. This manual is based on the U.S.A. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

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